Computer Systems

NEWS IN BRIEF

Euro mergers

EURO MP and deputy chairman of Ferranti, Basil de Ferranti, Iast week urged European computer companies to atop looking for public money and get behind the drive to create European institutions big enough to chailenge the Americans and the Japanese.

Those like Control Data and NCR which filed lawsuits for losses caused by the revolution are among the 300 US companies now looking for their claims to be resolved by the International Tributian being set up as port of the deal linest included the release of the linestages.

IRM still has a breach with 170

big companies was the size of the local market they had to operate in. Europeans should apeed up the integration of defence and PTT integration to create the same kinds of market for the European

Bigger, cheaper

IBM in the US has added seven models to its family of 3274 terminal controllers. They use 32K-bit memory chips instead of the 16K-bit devices in the four older 3274 machines and come with memory capacities of either 64K-bytea or 128K-bytes. With 128K-bytea they still cost less than an older 64K-byte 3274 with a 64K

Tandem expands

Information on software and applications, and the results of case
start using microcomputers. It will
include training and demonstratinn centres in London and clsewhere, and a national federation of

calculation relations the Department of
Information on software and applications, and the results of case
studies will be on hand.
On the thorny question of whose
equipment would be on show of
the microsystems centres, group
director Derek Scriven said the TANDEM, builder of the "ran-safe" NonStop minicomputer range, is expanding its manufac-turing capacity in the US by 80%, it is to apend nearly \$14 million on a new factory at Reston, Virginia, thot will employ 300 people by 1983. Another 75 will work at a plant being leased at Santa Clara, California from printer firm Data-

Fujitsu US move

FUJITSU is the latest Jopanese electronics company to announce that it will market personal computers in the US. It will introduce its personal computer terminal based on a word processing techni-que in the Spring.

Double CTL order

PAST-GROWING electrical wholesaler, the British Distributing Company, has ordered two CTL 8046 systems from Computer Trechnology. Applications will intellige real time integrated sales order processing, stock control and online customer involving at the warehouse counter. There will be a total of 36 tarminals at BDC. oc a total of 36 terminals at BDC's

Pascal meeting

THE first meeting of the UK
UCSD Pascal users' group; USUS
and it at the Dragonary Horel in
Bristo, Aims of the group dictode
the compilation of a software
fibrary Each meeting will provide
disc copying facilities

Dealing with fires

FIRE origades represent a welldefined marker for Clarion, a computer coast breath fire in obilising
system from Perranti Computer
Synchs Based on a Ferranti
Argus 700 minicomputer, Clarion
comes with fire in obilising
system from Perranti Computer
Synchs Based on a Ferranti
Argus 700 minicomputer, Clarion
comes with fire in obilising
system from Perranti Computer
Synchs Based on a Ferranti
Argus 700 minicomputer, Clarion
comes with four VDUs and soft
wate that mables a dalabase of
available appliances and personnel
to be of careed and assessed.

New hopes for US firms in Iranian market

turers are waiting in the wings for the cuc from the new US governneeded — MP ment to resume trading in Iran.
Those like Control Data and NCR

and the Japanese.

De Ferranti, speaking at the British Computer Society in London, said that the principal reason the Americans had produced each big compaules was the size of the

existing microcomputer centres to

A new division of the NCC is

promote co-operation and stan-darde.

being set up, with a separote iden-oty, to cater specifically for users

and overcome, in the worde of NCC director David Fairbairn, the

"apprehensions of small busi-nesses" over the problems of ac-

quiring computers. In return for a £25 yearly subscription firms will

receive newsletters, discounts on

publications, and priority at

NCC project to aid

small micro users

A MAJOR project has been saunched by the National Computing Centre, with funding of \$250,000 from the Department of Information on software and applications, and the results of case.

tory, said that his company was ready to resume business with its Iranian distributor, Iairan, which had 700 people when the revolu-tion started in 1979 and which still existed "on paper" existed "on paper".

Isiran serviced 12 big Honeywell

systems with key public sector cus-tomers like the Ministry of Finance, the army and the air force.
The Honeywell spokesman said
that Isiran had plenty of spare
parta when Honeywell had to pull out more than a year ago but there had been no rontact with Isiran for some time and the current level of service waa unknown.

a very good market and was trying

selection would be "smoll but re-presentouve", and that without

wishing to endorse certain makes the NCC would want to make cure

that the kit It demonstrated was

"good and sound".

A spokesmsn for Honcywell ita-lia, which includes Iran in its terri-tory, said that his comments the rouble started.

ing set up a joint venture with the iranians in 1978 to sell the complete range of Univac equipment and to build the V77 miniromputer under licence. Univac's parent, Sperry Corp, is suing the tranian government for \$15 mil-

Control Data, which filed a \$28 million lawauit last year against "iran, Iranian firms and individuals", had established a joint venture to build its Plato compu-ter-based training terminals and was setting up an institute for

Honeywell has regarded Iran as contact with its former Iranian national employees even though in Iran,

AN ICL 1901T, a Digital Equipment 310, en NCR 8200 and 8130 end two Singar System 10s will be the lots going under the hemmer on March 11,

the 40 US citizens working there for CDC had to be evacuated early

NCR is auing the Iraniana for \$5 million, its 62% interest in its Iranian sales end scrvice operation having been expropriated by the iranian government. NCR kit there consists mainly of accounting machines and point of sale terminals, and former employees have now resorted to "cannibalisation" to keep equipment running, according to an NCR apokesman.

The UK's Scicon consultancy, which has a major presence in the Middle East, pulled out of Iran around June/July 1978, several months before the trouble started, purely because contracts there had iCL has never hed an operation

be very low, as illustrated et e So-theby's euction in New York leet November. Although the only



More jobs

JOB opportunities in commits for graduates in 1981 should reasonably good, despite the de-ters of last year when two inwithdrew large number de

That is the view of the Ann tion of Graduste Careers Admis Services and the Standing Care ence of Employers of Gradus, who admit that their joint one ing jobs forcesst for 1980 and by realistic", and now predate 'slightly up" on the roul?

figures.
Total graduate recruiments
1980 was 20% down on long
Sectors such as software her most of whose recruimer among graduates, have a paid larly chilling effect on the feed during a recession, while large that hire only a few graduate cut back without making the impact, explained Tony Runi AGCAS.

Withdrawing job offer, as been done in 1980 by 101 CAP, was unlikely to retain cause firms were being more it thous in recruiting, Rabai miles. But, he added, these incises were unfortunate in this demade it look as if the whoken putiog industry was in took to contrast, over 700 inquire been received over the 10 puties shed by ICL.

It was however, me

manufacturing was being in the recession much worse the pressed by David Joven SCOEG, who saw resent to

Winsford, Chappell said that the cost of this would be borne as an extraordinary item in the accounts

He said the company would continue with the policy of going for medium and small computers. No A PiRST quorter loss of £20 mil-lion was disclosed by ICL's chair-man Philip Chappell, at the company's annual meeting earlier this week. The company will also for 1981. A figure of £10 million was suggested as a likely cost (Chappell said he would not disagree with this figure).

£30m loss

Pay freeze as

ICL heads for

produce a loss for the second quar-ter of the financial year.

With the business expected to break even for the second half of the year, the year-end loss is predicted at about £30 to £35 mil-

COMPUTER

As a result of the figures, ICL-has told hourly paid employees that the company cannot afford a general increase in pay during

Recession '

Chappell blamed the losses on soverse trading cooditions, the continued strength of sterling and the current deep recession in the UK. Deliverles in the first quarter was retrieved to the current deep recession in the UK. were particularly low.
The chairman said that given

revival in worldwide markets and especially in the UK he expected a ignificant improvement in

Action to conserve cash flow has been given a first priority in the

Io the year 1980 the company disposed of 14% of its property in the UK. Further premises disposals are being considered for 1981.

When Chappell was questioned about the possibility of further major closures, he said that there were oo current plans but that matters relating to production were under cootinuous review.

He expects expenditure on

Number 743

He expects expenditure on R&D to be maintained. He further announced that 750 orders have been received for the ME29 with o

Iapanese impact

possible turnover value of £75-£120 million.

He indicated that there were no

rompete in the supercomputer business, which he defined as 20-30 MiPS.

ronclusive answer was given to questions relating to the 2972 and

bigger end of the range. Chappell added that he believed

the Jopanese would have an impact in the UK market place and abroad, and that ICL would not

The chairman indicated that there were adequate facilities with ICL's existing banks to finance the rompany and if needed these

Thursday, February 5, 1981

ICL LTD

A High Court Writ has been served on IPC Biectrical Electrooic Press Limited, publishers of Computer Weekly, by the Sollcitor to ICL Limited and He indicated that there were no plens to ask the government for financial support, and that ICL maintained very close relations with the Department of Industry.

The Dol is fully aware of the short term probleme facing ICL and ICL's plans to surmount the probleme, said Chappell.

Electronic These Meekly, by the Solicitor to ICL Limited and International Computers Limited. The Writ claims damages for libe i cootained in the article concerning ICL published on the front page of the January issue of Computer Weekly.

Chaps to go live in 1983

The Bank of England - a major participant in the new automated payments system between banks.

Price 25p

tern protest. Coursesses heartes bereite

Payments System, Chaps, which was cancelled in its original form a year ago, has been given the go-ahead in its less expensive decentralised form.

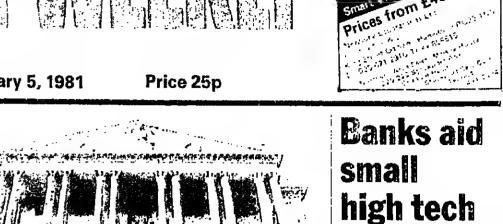
ment and a leased line to the ICL 2960 host. Many of the smaller banks abjected strongly in the costs they would have had to bear.

With the new Chaps system they can carry on using paper if they

As reported in Computer Weekly last year, the clearing banks will be linked to each other la British Telecom'a Packe Switched Service and will take ad-vantage of the closed loop facilities offered by PSS for security. Chaps is expected to go live in

stages in 1983 and will replace a large part of the existing manual Town Clearing procedure for handling same day clearing of larga, transactions between the clearing banks and the 200 or so other banking concerns in the City of London, many of them international, that maintain accounts with the clearing banks. The Bank of Brigland and National Giro will be major participants with the clear.

A CHESHIRE-BASED consul BASED on triple Burroughs lancy has bought the computer B6700 mainfrances. New York's division of the Alfred Herbert Glearing House Interbank machine tool empire, which was Fryntents System. Chips, is finally liquidated last year. The moving over to same day clearing consultancy, Organisation Decoret I. At the moment additional consultancy.



businesses THE PAST few weeks have seen a lethora of new small business and enture capital loan preanisations. mostly with computer and high clinology companies in mind.

mittee on Finance for Industry was told that there is a serious shortage

The Royal Bonk of Scotland, partnered by Scotlish Western Trust and James Finlay and Cohas set up a fund with initial copical of £3 million. The ubject is to provide equity finance of between £50,000 and £500,000 for small and developing companies, parti-cularly in the computer and high technology fields.

It will also assist individual shareholders to dispose of their shares in private and unlisted com

Bank, the BEC's banking insultation, is to increase its load substantially to amail and medium-sized businesses in the UK's assisted regions.

After two years of attempting a operate the fund through the Department of Industry, the EiB is to make its services available through the Industrial and Commercia

Finance Corp (ICFC). in the years with the Depart nent of industry, the EIB mad

28 loans totalling just £5 million his compares with 521 loan nade to entrepreneurs in the insi tepublic over the same period Finally, the government-backet

loan guarantee sebeme looks as if, will feature in the Budget. Unde this scheme, the government wi guarantee loans made by bank and others to small businesse

Redundancies at Altergo

Altergo managing director Dave long-term effect."

Brownlee was unavailable for One source suggested that In-

Compec for

Manchester

The show follows an analysis of visitors to Compec UK in November 1981 which showed that almost 80% of visitors came from the South East. Belle Vice is Greater Manchester's major exhibition site, just 21% niles from the aty centre.

A CHESHIRE BASED consul-

Herbert sale

THREB of the marketing staff at systems house Altergo were told last Friday that they were redundant. They included Calvin King (see Software File) who was! to call year. "There'e nn way that we launch Altergo's latest TP aid, CPG... The language.

The language expenses which wouldn't have a

been long "sigoed; sealed and hap-pily put away" and any problems Altergo had were not to do with

Same-day clearing

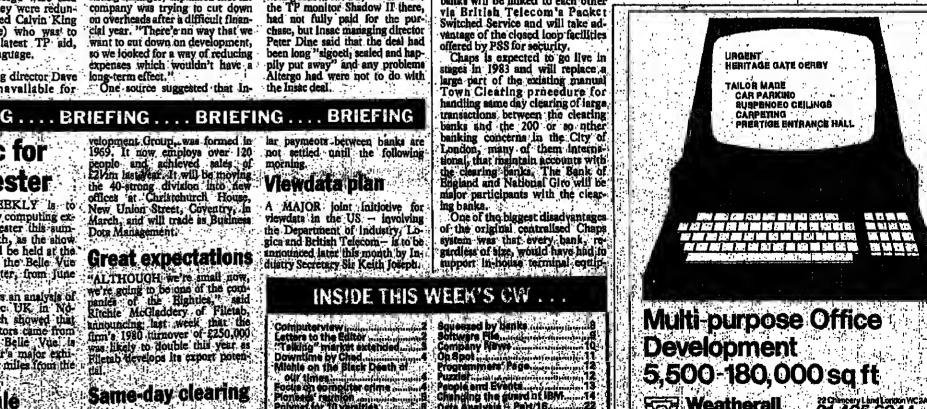
BRIEFING BRIEFING BRIEFING

velopment Group, was formed in lar payments between banks are 1969. It now employs over 120 not settled until the following people and achieved sales of morning. E2/2m Issaefest At will be moving the 40-strong division into new offices at Christohurch House, A MAIOR joint introduce for

Jaunch a major new computing exhibition in Manchester this summer: Compec. North, as the show will be known; will be held at the Laricaster Hall of the Belle Vue complex, Manchester, from Time "ALTHOUGH we're small now, we're going to be one of the com-

Puzzisi 13
People and Events 13
Changing the guard of IBM 14
Data Analysis 1 Palv 16 22
Seles Bit 14
Grassword 46
MFs prace for privator law 48

JOB OPPORTUNITIES: Pages 23-47



Multi-purpose Office Development 5,500-180,000 saft

Weatherall Green & Smith FRANK INNES

22 Chinology Land London WC 2A KT

Derby 31181

Als an La

"good and sound". The existing centres, such as those at universities and of the World Trade Centre, which joined the national federation would have to subscribe to a code of practice, Scriven said. Scriven said. Centre is placed to open on April 2, under the direction of Eric Bird. Green is going under the hemmer on March 11. Misheel Hert and Misheal Green, which is the one with the hemmer, ere founder members of Computer Although the only pleas of kit to reach the reserve price, en IBM 4331 chenged hendo of the life in the selection of the control of Computer the interest their vanture here pensaged at the interest their va Direct L/P EEC to spend £3½m of news on Ada development likely at THE European Communities The second project is to develop Commission is to spend more than a third of its annual DP budget on two development projects on Ada, the new high-level real time language specified by the US Department of Defence and developed. The Times THE chances of new technology finally making invoses into Fleet Street look marginally better, following the acceptance of Rupert Murdoch's conditional bid for Times Newspapers. Murdoch has to reach agreement with the import before the guage specified by the US Department of Defence and developed by CII-Honeywell Bull in Europe The two projects are worth £3.5 million and will be managed by two inited nationality consortia. One is for o "root" compiler portoble between mini, micro and mainframe machine. It will be carried out by o Danish/Italian team consisting of Danish Dotsmatics Centre, Olivetti, and Rovsing. The team will be using the British systems house Systems Designers Ltd (which is part of Britain e 238" Ada consists.

3033 - N12 and N16

April



Plus supporting peripherals

frame machines. It accounts for £2.01 million of the budget and will be earried out by a French and German team from CIPHB, Siemetra, and Aleys, whose president learn at CIL-HB.

Jean Ichbioh headed the Ada desagn team at CIL-HB.



the proven Relational Database System.

Running on 15 different machine ranges

Relational databases are easy to understand and easy to use - but are they practical? RAPPORT gives you like practical features needed to manage a working database: - Indexing for its retrieval by any key - powerful, readable program commands - Interfaces to FORTAN a COBOL and CORAL - physical date interpret dence - full update logging and recovery support of multiple users - Interactive Query Language - data access protection to field level.

To find out more, write of phone quoting ref. RAM

Tricia Morriadi
Logica Limiled
68 Newman Street
Liondon WIA 458
Lelephone (01) 837 911

RAPPORT

To find out more, write of phone quoting ref. [All I

Printed in Great Britain by OB Limited, Sheepen Piace Confess 1884 and published by IPC Electrical Electronic Press Ltd. Quadrant Classification, Surrey Saltz AS

01-861 3102

IPC Electrical Electronic Praes Lid. Ouadrant House, The Ouadrant, Sution, Sumey SM2 EAS. Tales: 892084 BISPRE O

Manchaeler: Grove Hirose, Sherion Noed, Old Trallord, Manchosior Mild OW. Triephono: Offi-\$72 U8(1).

New York: 205 Ecol 42m1 Street, New York NY 19917 Tol: 15151-2121 667 2060.

Registered of the Post Officer as a newspaper. Price per copy 25p.

The lollowing aditorial staff can be contected on 01-861 3500, with the extensions shown:
Keith Jonas 3535
Rory Johnston 3534
Kewn Cahill 3538
Claira Gooding 8541
Ellean Stälner 3540
Peul Flaher Peul Flaher Donald Kannett

ADVERTISING - Display The following stall cen be contacted on 01-651 3500, with he axtansions shown: Chris O'Hae ten Carter Xenis White Steva 8ass Devid Hegen

Aaπcheste 061-672 886 021-358 4836

ADVERTISING - Classifiad The following staff can all be contected on 01-661 0121: Chris Prier Kan Welford ien Feux Nail McDonnell

Danias Smith Julia Hannaford Kevin McOwan Gillien Johnson Peter Regis 061-872 8881

021-358 4838 ADVERTISING -Production
The following stell con be contested on 01-861 3500, with the extensions shown:
Stave Layor 3104
Rogar Alburey 3574

Computer Weekly is sont from of charge to the indicator of charge to the UK and Eliza only company directors, company

sacretaries, menagement service axecutives, civil servicite respending management or servicite respending to a servicite r menells (faupervierte, epetems anolysis/O.M. ellica), 178 grammers, optidista, dombiler saleanen, field algirebra,

ISSN 0010-4787

COMPUTERVIEW

Neither down nor out

BLEAK though the news is from ICL today, the company is neither down nor nut. Anguished analysis have wrung their hands enough in shock and horror, mostly at the failure of their own naive expectations. It is time for realism, and realism in this case begins with the policies of successive governments which have left a company like ICL to fight its international competitors with both hands tied behind its back, and

There is no other way to describe a situation in which a company has to pay twice as much as its competitors for money, sell its products in a currency which has risen by over 20% in a year, and which is forced to underbarraw by a three-to-five fold factor compared with its Japsnese

The table shows the situation ICL is faced with in relation to two ot its main Japanese competitors.

Borrowings et NEC and Toshiba are quite close to total turnover. R&D in both cases is quite close to ICL's expenditure on this item.

ICL AND THE JAPANESE COMPETITION

_				
	ICL	NEC	TOSHIBA	
8orrowings Shareholders Turnover Profit R&D Spend	160,000,000 · 140,000,000 715,000,000 25,000,000 70,000,000	1,781,000,000 271,000,000 1,833,000,000 56,000,000 91,000,000	2,392,000,000 400,000,000 3,658,000,000 110,000,000 145,000,000	
Average ege to repeyment of debt	2.3 yra (approx)	7 yrs (approx)	7 yrs (approx)	
debt	16.25%	6.33%	8.33%	

Converted into £ et \$2.20 to £1.00.

In the NHS, however, there is

no profit motive for installing com-

puters. As a result the UK systems

have to sell themselves on their

high standard and their ability to

meet the needs of medical, nursing

and administrative staff lovolved

in the various aspects of providing

I do not wish to decry the excel-

lent achievements of the successful

currectly attempting to break into

the health services in the UK and

the views expressed above in not-

ing that the companies mentioned

A. H. TULLY

are in the process of "anglloising"

Managing director

patient care.

Figures ero approximete, also, while the items ere broadly comparable ting treatments ere not the same as those in the UK, i.e. shareholdars funda may, by UK atenderda, ba undarstatad.

LETTERS to the EDITOR

Computer developments Blowing a trumpet in the Health Service

your article headed Helping Hos-pitals in the UK to Catch Up (CW, Jatuary 18).

To suggest that the use of imported computing expertise is required to assist a backward health lack if knowledge and under-standing of the wide range of com-puter focilities being used by the National Health Service and the systems currently available from

A good but fairly typical example of the ways computing is being developed in the NHS is demonstrated by the North-East Thamea Regionol Health Authority with which I was em-Authority with which I was employed as regional computing services manager. At the time of leaving NETRHA come 18 months ago to set up Health Computing Ltd, the region had over 40 computer installations covering a wide range of application areas manager. range of application areas running on a variety of computer types from the large ICL mainframe running baich commercial applications, through large online systems rtutting patient services applica-tions in hospitals to the smaller

mini- and microcomputers. The region was involved in the forward-thinking DHSS-sponsored experimental programme conceived and initiated during the late 1960s to develop online real. time patient services and patient care applications. A considerable systems have added on the patient been instelled throughout the UK systems as an afterthought; as a

example for each language a simple common classification scheme of features or descriptions really to one majority language.

Such an approach would give the uninitiated a clearer picture of each language's capabilities than your contributors life inferores and enthusiasms.

If the APL article, the absence

THE EDITOR welcomes let-ters op in manting on subjects published in Com-puter Weekly, or on original topics. All letters must be actompaned by the writers name and address, not necessarily for publica-tion.

In common with other regions, NETRHA is well served with high calibre computing atsif with con-siderable health care experience. Unfortunately thay are coostrained by the administrative environment in which they have to operate and the different motivation factors. Arising out of the initial experi-

mental programme which only ended in 1978/79 with the evaluation of the projecta, a number of new systems and additional instalnew systems and additional instal-lations have emerged. As well as those developed by the NHS a few commercial organisations have de-veloped packaged systems. Health Computing Limited, during its 18 mnntha existence, has developed a range of health care packages, and ia in the process of installing patlent administration and poratory systems in 10 hospitals in the UK and Ireland, plus a number of micro systems in GPs'

and dental surgeries.

In your article you referred to the large number of systems in the US as against the UK. Assuming that size for size you are right in implying that the US has a greater number of aystems installed, then the reason can easily be identified. The main motivation for installing computors in the US is the billing of services and control of cash flow and profitability. One gets the im-

Database

I TRUST that Nicholas Pollard (CW; January 8) does not classify himself as a knowledgeable database observer with regard to pure relational database management systems. I have been using the Honeywell Multics Relational Data Store (MRDS) package with the LINUS query and tipdate user interface since 1978 at Bristol University and this uses the full rela-YOUR series on minority languages would be greatly enhanced by some descriptions of itheir least arcane and not supported by most versity and this uses the full relational model. Logica's Rapport is would put many prospective users.

CREG MICHAELSON

CREG MICHAELSON

Data Store (MKDS) In the Linux query and tipdate user that Interface since 1978 at Bristol University and this uses the full relational model. Logica's Rapport is being developed and this should not take nine years to implement fully. What about INGRES and RENDEZVOUS? Minority languages

offered in return,

University of Glasgow Dept of Computing Science, 16 Lilybank Galdens, MARGARET SHAPLAND University of Bristol

1984 and all that .

THIS week's example of the strange things people say in the media about computers was sent in by P. Kingsley Williams of Chester, who wins 15.

A new computer system which is shortly to be introduced into libraries in Gheshire is in the process of being tested at Blacon Library. The first piece of equipment is primarily concerned with the issuing and discharging of books whilst the second piece called on Intelligence Terminal will give information telling a librarian whate a particular book can be located.

for MicroCobol

Microsoft'a software and, in consequence, I read with interest your report of the recent CAP-CPP/Microproducts "de-merger" (CW, lanuary 22). May I correct an inaccuracy which crept in towards the eod of an otherwise well-informed and accurate piece?

It is not true that the Micro Cobol end-user is limited only to CAP's range of products for off-the-shelf business software. My American companies which are nwn company has put considerable effort into developing sophislicated multi-terminal business

rage MicroCobol receives in the technical Press. Any programmer familiar with the verbosity of standard ANSI-74 Cobols would profit by an evaluation of MicroCobol's acilities and be pleasantly sw prised by its terseness, clary, well-structured spproach and owerful development aids.

I make no apology for using his pet" since I feel that such an impressive British development should receive wider recognition.
R. G. BISHOP

Inter-City Computers,



Tel.(O272) 25921 Telex. 4492O5

NatSemi and GIM extend talking machines market

inal speech information.

This method allows the com-

voice the sturage is 1,tt00 bits for a

single word. The female voice uses higher frequencies and security

NatSemi can decode and store

either words or phrases and will the

so on a custom hasis for a fee. This

allows the user to buve his own

voice recorded as required for par-

Vocabulary

General Instrument's product,

called VSM 2032 (vnice synthesis module), has a vocabulary of 34

words. It is a simpler version of the company's speech synthesis chip, the SP-0256 announced last No-

vember, which uses both the pho

neme method and a linear predic-tive coding method of speech synthesis for two qualities of

about 1,500 hits per word.

frequencies and requires

CDINCIDENCE struck the fast digitised, compressed and stored, developing speech synthesis mar-ket last week when both National representing a merc loof the total Semiconductor and General Intrument Miernelectronics anpany to store about 30 words in 4K-hytes of ROM. For a male

The products are aimed at potential users of speech synthesis and are designed to introduce them to the concept and the quality and understandability of the speech. Both contpanies have incurporated their speech synthesis chips, a intemprocessor and ROM memory un in a single printed circuit board with hasic vocabularies of typically used words.

By introducing evaluation boards both companies have effectively widened their markets to include the small volume users. Previously, with just their speech processors on the market, the companies addressed the large volume

Both products are supplied in a chip form for about £50 and require the addition of user interface

Nstional Semiconductor's pro-duct, based on its Digitalker speech chip, is also supplied in the assembled board form, the DT1000, with a vocabulary of 340 vords st a cost of about £300.

NstSemi'a main strategy ia high justity speech for which it uses a digitisation and compression method of synthesis. Fundamental component waveforms are extracted from the speech waveform, which in its normal form is a

are divided into sounds, called phonemes, of which there are 64 in recorded digitally and then extracted when needed to reconstruct the word. The linear predictive coding method, which is also used by the

other major US competitor, Texas Instruments, uses a mathematical

sales of office personal computers.

. The study indicated that the US

has no international trade policies

'US could lose lead in personal systems'

THE US stande to lose its lead in and \$18 billion would probably be the worldwide personal computer market by 1990 if the country's industrial and trade policies remain as they are, according to a study of this market carried out by the Universty of Southern California.

The study noted that the US

market is growing twice as fast as the world market and that US manufacturers are now domination international trade. It poloted out, however, that other developed countries, especially Japan, the UK, France sod West Germany, are coocentration on capturion some, if not most, of the personal

By 1990 the US market for per-sonal computera is estimated to reach \$21.5 billion. Between \$1 billion and \$3.5 billioo could fill the demand for consumer pro-ducts, while between \$4 billion

Suggestions include lax incentives, productivity improvement credits for users of personal computers, and federal subsidies and loans to high growth industries and email technology-inteosive

past which have developed because of a lack of international trade restrictions, and they involve mainly Japaoese companies. Toshiba was accused of dumping microwave overs in the US, and ten years ago Japanese television makers were similarly accused.

British Telecom £19m loss

million in the six months to last parget announced in Parliame of on September compared with a profit of £60 million in the same period the previous year. A major factor was the 25% increase in its pay bill, it is now trading profitably again following increases of about only protect investment by raising 17% in telegram unleations charges last November and expects

BRITISH THLECOM fost £19 It is unlikely to meet the revised

oharges last November and expects from the government of elsewhere to meet its previous target of 5% We are looking at alternative return of het assets at replace methods that do not affect borrow-

EEC funds Irish airport study

IRELAND's national alreports inferoelectronic techniques in air-authority, Aer Riants, and Dublin port operations, software house COPS will share than agement of an EEC-funded to complete and cost up to etudy dealing with computers and 1750,000.

the customer evaluation problem in a different way. "Words off the shelf," or the Orator Project as it is and if the customer requires a called by Texas involves the puteuselection, a Texas distributor can tial user listening to a library of place the words on to EPROM. words supplied by the company.
The library consists of allow The company will also encode specific custom words for about ,000 words that have already been £200 a word.

German, Scandinavian, name it. And one

thimble will last more than 30 million clear

Thanks to our own LSI and microprocessor

technology, the NEC Spinwriter Series 5500.

which comes in thrae models, givas you

Impressions. Quietly, quickly,

And that's just for openers.

stored data is passed through the

Texas Justruments has tackled,

"I want something that will talk

machine with a one-off price of C7,500. Nexos is understood to be developing a cluster system, to be made, like the 2200, by Logica, which will have up to four screens sharing one processor. Each 2200 now contains a 16-bit Intel 8086 all

> The cluster machine, codenamed Torundo, would be capable of driving a hard disc as well as doppies as are used at present. A closter version was planned several

NEXOS' advanced word processay predecessor to the 2200, bu is did not come to trimion.

COMPUTER WEEKLY, February 5, 1981.

Nexos word processor

First big order for

or, lanuched last November as the

2200, has had its first big success

in the marketplace, capitiring an

order from Commercial Union In-

the UK, taking advantage of their

The 2200 is a stand-alone

surance for up to 65 machines. The word processors are to be installed in branches throughout

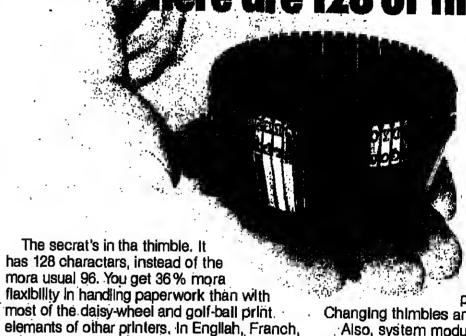
communications facilities.

Development work on Unicom. Lugica's original shared-logic system, has now been taken away troni Logica entirely, and is carrying on at Nexos and at Unilever, the machine's first customers. Development had been let fall behind

Qatar ioins Datapost

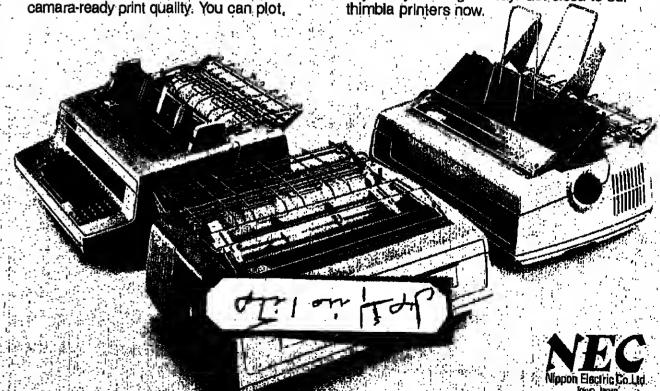
QATAR has become the 19th country to join the Post Diffice's

You have every reason in the world to switch to NEC's "thimble" printers. Here are 128 of them.



graph, superscript, subscript. Tab horizontally or vertically. And print bidirectionally.

Changing thimbies and ribbons is a snap. Also, system modularity maans your Series 5500 printar will grow as your raquirements grow. And one of the nicest things about it all is that it really won't cost you a thing to switch. 7 Interlace capabilities, including those for Diablo, QUME and Centronics. means tha NEC Solnwritar is raady to work In your systam right away. Get closa to our



NEC Telecommunications Europe Co., Ltd. NEC House; 1541 956 Drummond Sirsel London NW1 3HP UK , Tel; 01-388-6100 Telsx: 2819 t4
Thams Systems Ltd. Thems Park Industrial Estate Thams, Oxon QX9 3RS Tel; Thams (084 421) 5474

Datapost service, which provides rapid air transport of high-value tients such as magnetic tapes and

Downtime

by Chad

CONFESSIONAL

Information gaps

new factory? It seems you could hoose no better place than Merseyside, from what I saw in an dvertisement in a taxi the other day. The sign was placed there by Merseyside County Council in order to induce businessmen to

come to their patch. It read, "GEC Fairchild have ehosen Merseyside Special De-velopment Area for their first microprocessor plant in this

Apparently the news has not yet reached the Liverpudlan hurcaucrata that the GECl'airchild deal was ealled off in luly last year.

No, I'm sure it's not their fault. The mail is probably carried up the Viking Border by Galapagos tortolse. Speaking of Galanagos turinises, en experi-

LOOKING for a go-ahead, on-the-ball area to build your shiny killing some time in their local boozer, the Blue Posts in Newman Street; Berners Street sorting office is right aeross the

> They posted a letter addressed to the pub in the pillar bux outside the door. It took four days to cross the road and return. The Logica people with their ma-thematical agility worked out that a Galapagos tortoise would have been considerably faster.

No nudes is good news

FOOTNOTE to Rupart Murdoch's impending tekapyer of The Times: our Austrelian Press duke has promised not to thrust his Sun styla of journeliam on to the Old Ledy of Grey's inn Roed, end this has disap-

pointed some people.

The boas of a lerge edvertising agency let slip lest weak that he was planning, for Murdoch's first issue, to buy pegs three, slap a large nude ecross it (The Times cen hardly refuse since they've printed one before) and headlins it "Hare's one for you, Diggart".

Could hecome an old established British tradition, she cobber?

Keeping in time with ICL

sily organisiog a lecture next month, to be given in its stately-home software centre at Dalkeith, admission to you only £50. The aubject? Biorhythma.

A Mr Bernard Gittleson of New York will be talking on how to use a computer to work out your biorhythms from your

Fortunately for ICL it is not the first computer firm so fall into the elementary trap laid by this trendy subject. I have al-ready had words with Sperry Univac over this (to no avail, I fear). Whoever thought up the trick of working out the three bodily cycles over your lifetime from your date of birth failed to recognise the fundamental dif-ference (of which all programmers are aware) between integers and real numbers. There may well be biological cycles for your physical, intellectual and emotional well-being, and these

respectively as claimed, but there is no way these periods could be extrapolated over 30 years and still keep in timel

if the periods are real numbers they would have to be, by some miracle, exactly 23.00000 days and so on, and if they are integers there would have to be a digital biological elock to meaaure them. Who ever heard of a

digital biological clock? The other unquestioned asumption is why should the eycles all start at zero at your mo-ment of birth anyway? Doubtless because your ascending birthstar triggers them off. Then you have to remember that the cycles get reversed by your awinging the wedding ring over the unborn babe to determine ita sex.

On all these matters ICL had no comment. I'm waiting for the Treasury to briog in a tea lcaf lady to help out with the econo-

Cover-up

That eminent priest of computer crime, Dono B. Parker, immed-ately warned the world that education is oow producing a new generation of computer criminals, vandala aod practical joken. Meanwhile, statistics presented a recent NCC computer from semioar backed up the compact erime figures. It would seem the computer crime, particular fraud, is subject to a blanket com

FOCUS

Computer

THE NEW YEAR has not stated

well for the DP industry, with a uncalled for rash of computer

crime scares featured in the

national Press. It would seem in

link between computer crime and college boys is now well proven.

The latest episode to set the alarm bells ringing all over the US, according to the Daily Mail

concerns the erasure of ten milite

items from a computer netwo

memory and the alteration

programs, all completed jun b

connecting a small terminal to 1
phone and dialling the installation
Repairs, it is reported to
three days and cost a surprising

small £10,000. Given any

couragement, the average insula-

produced aimilsr havoc in the

course of three minutes' dedicated

work, with repair retrieval taking

closer to three weeks.

tion operations team could be

crime

Frauda are most often dis-vered by accident with sudion revealing only 5% of all known eases. This figure does not summ Rod Perry, of Coopers and Labrand, who told the seminar the all controls cost money and the business involves risk. A balance must be achieved which will dear fraud while not introducing regist-

The worlds of computer crime vacy are interwoven. Categorie, divisious and parameters, in much the staple diet of the indutry, get heavily blurred and act just at the edges.

The IDPM has published figures suggesting that crety month, £50 million work id electronic equipment is damaged by fire. Practical contlages

Meanwhile, Good Housekee ing links computer information es with Nazi storm-trooper the evils of Swansea and the threat of a national census. The arick called for greater vigilance and control, with the NCCL taking a close hand.

lenge to muster sufficient, sources to provide full coverage Such levels of vigilance and ster-tion would leave most Dirich in mused. They already have could problems on hand in meeting deadlines, rival sales teams, trut user department heads and des frequently) the site engineering

GREATER POLICE

OVER 100 computer pioneers packed the Swan pub off London's recall the "good old days" of the computer industry. The occasion was the tenth annual reunion of former members of De La Rue Bull, one of the first computer companies to be established in this country, and which vanished from The two men who initiated the reunions, Iain Holden and John

the day, since they first joined De Roger Ford (right) celebrated the sale of a Gamma 10. It is 16 years since the Sull. The company was they were made.

Like others present, Holden and former operator and now a director outlived its usefulness at a nearby frown have since gone on to of the VLI recruitment and soft- school, is to be acquired by Brad

CELEBRATING THE 'GOOD OLD DAYS'

Industry

pioneers

the scene in 1964.

at reunion

Southampton Row lass Friday, to

Brown, were celebrating another

event - it was 20 years, almost to

Brown have since gone on to higher things. Holden is now European database manager for Honeywell Controls, while Brown

works in a senior capacity for ICL. Other high fliers included John

DISTRIBUTION of satellite-

vices between earth atatioos and

users' equipment is one applica-tion for the Net/One local area net-

work that its manufacturer, Ung-ermann-Bass, is investigating in the US with Comast General, the

satellite operating company.

Company a Integrated Design and
Manufacturing Systems division is
likely to be an OEM customer for
Net/One networks for inclusion in

its computer-alded design and

manufacturing systems. In its test

installation, Comsat has a Honeywell 6000, a Hewlett-Pack-

ard 3000 and two Digital Equip-ment VAX-11/780s, one of them

running under Unix, linked via a

Net/One to a number of VDUs,

End of year

The result is that interfaces to a

number of widely-used proprietary "standards", including the Digital Equipment Unibus, the IBM 3270

bisync display and 3780 remote job entry terminals and the Hewlett-

Packard general purpose interface bus: are to become available to-

Unerrowner Basa is, also developing apport for tritual threults and datagrams in line with the Transport Service level, level

four, of the International Stan-dards Organisation's seven layer

scheme for open systems intercon-

ection, Higher level protocols, such as

wards the end of the year.

test equipment and special termi-

Local networks for

satellite services

ware group. celebration was Roger Ford, a on acceptance trials, is expected to former salesman with De La Rue Bull now working for Univac. He substantially less than the 1964 Ockenden, who went on to become head of Scicon, Ian

was able to announce the sale of a price.

Gamma I0, one of the firm's most

Fo McNaught-Davis, managing successful computers in the early director of Comshare, Derek 60s, but rather thin on the ground

Price, president of Comshare today.

Canada, and Rupert Bayfield, a The machine, which had

jump on the Ethernet bandwagon, as that would be the fastest way to

bring down the eost of local net-

working for all, even if it were shown that Ethernet was not the best technical solution.

This would be equally true for the Cambridge Ring or any other design, be added, except that the money tening put behind lathernet by three of the biggest companies in the US was unlikely to be

Should an alternative scheme

prove Itaelf in the market

probably make a version of it since

t saw itself as a generalised local

networking company rather than a alngle product company.

This is a philosophy echoed to the UK by Orbis of Cambridge, which already makes two local net-

working systems: an implementa-tion of the Cambridge Ring and

Econet, its own slower, cheaper bus-based design.

Jordan confirmed that the Insti-tute of Electrical and Electronic Engineers, a US standards-setting body, had shown reluctance to en-dorse the Ethernet design auto-matically and appeared likely to back an alternative design, such as the token-passing ring or circulat-ing empty alor principle used in the Cambridge King, as well as the carrier-sensing multiple-access

CSMA/CD, principle used in

Net/One was designed in mod-

ules, so that the system could ac-

school, is to be acquired by Brad-ford University's new museum of One man with a special cause for computing. The sale, dependent

Ford's former boss, Ian McNaught-Davis, was quick to step forward with his commission - only 10p, but theo, he was 10 years behind schedule.

Logica Polynet for 10 universities LOGICA's implementation of the proved decisive was the option Cambridge Ring local area net- enabling Polynet to transmit packwork scheme, now called Pulynet, ets either 38 bits long, to be comhas been chosen by the Science Research Council for use in its patible with the early design now being built by others including several universities, or 40 bits long distributed compoting pro-

like the later design for which Fer-

ranti is developing two custom Production is to start this month in Swindon, where Logica VTS makes its word processors, for chips based on Uncommitted Logie Arrays. The two extra bits allow packets to be variable in 8-bit increments

up to 64 bits in length in future further organisations had ordered systems, to give the greater tory had enough production capa-city to cater for ten times the likely tions such as interactive graphics and digitised voice messages.

Choice

gramme is one of the major SRC-funded research projects under Another refinement is the choice of sockets for network nodes. One departments (as diatinet from contype allows the ring to have secons usserted or removed for expe-Coen said Logica had probably shorting plug luserted if no termiwon the competitive tender for nal devices are attached; the other Cambridge Rings because of the product engineering work it had version is for permanent wiring into a building which has selfshorting sockets intu which deyears.
One of the refloements added vices can be plugged while the net-

modified to adjost automatically to the timiog changes made when sn

extra device is plugged in.
Plans for this year include
discussions with the SRC, the Department of Industry and anothe company on submitting propose for networking standards, as well discussions with other colopanies on the production of compatible attachments and packaged systems fur complex applicatio

The three basic units in Polyne are the monitor station at £2,500 one of which is needed per ring system, the node station with repeater and transceiver at £830, o which up to 254 can be inserted into one ring, and the power supply at £400, one of which

needed every eight repeaters.
Advantages claimed for Cam liridge Ring systems, which are based on four-wire twisted-pair telephone cables, over coaxial-based Ethernet systems, are guaranteed bandwidth and rate of delivery, ease of locating fatilts, ease mum length of ring cable

MICHIE'S PRIVATEVIEW

The Black Death of our times—and some antidotes

PRACTITIONERS and acholars of information technology can tales to quieten children: after Milreasonably be accused of wandering in a plague-struck world with undisclosed antidotes in their

The Black Death of our times is the world's escalating complexity.
Outbursts of hysterical aggression, the growth of crank religions, fan-atical promotion of economic nostrums, superstitious trust in military nihiliam: these are the human mind's immune reactions to social panic, triggered by the monstrous growth of complexity. impenetrable, intractable, and

demeaning to us all. Bureaucratie complexity, economic complexity, social complexity they are everywhere on the march, and in countries of advanced technology the march has lately been breaking into an ominous run.

ton Friedman, the promised land; after Marx, the millennium; after a just war, freedom. Yet one or two facta suggest something different from all this, namely a grave deterioration of our mental power to

where we are plainly not becoming less intelligent, nor in any absolute sense less educated? The catch is in the words "any absolute sense". Life does not test the power of mental coping in abstract, but only relative to the difficulty of some environment. The true determinant is the "coping ratio", and it has both a numerator (comprehen-tion) and a denormanator (complexity). It is the denominator which is getting out of hand.

between education and catastro-phe. Although we might redefine "education" more broadly than was possible for Wells in his day,

How can this be in Britain,

Pifty years ago H. G. Wella des-

Those paid to do our thinking eribed our predicament as a race

Quarrelsone

few will doubt that the force of his words has been multiplied over the Bach life strikes a balance be-

tween a skilled mastery of prob-lems as they come in and a seose of slopping and sliding in a welter of other people's purposes. That bal-ance determines a large part of the difference between a resentful and demoralised workforce and a team; between a rigid and insensitive management and a leadership; be-tween an obstructive and self-serying bureaucracy and an organ of transmission of the democratic will; between an island crammed

with distractable and quarrelsome mates and a creative and self-res-

Some of the needed steps can be facilitated by intelligent application of information technology, for Reduction of the organisational

complexity of governmental and commercial agreemental by ivances in office automation

Mass availability of expert privisory systems to enable the ordinary person to re-establish mastery over nis own affairs;

Use of micro-based training alds, including intelligent teaching systems, over viewdata-type networks including telesoftware faellities. Schools, polyrechnics, universities, professional courses, industrial training and bill laments and retraining schemes could all

 Exploitation of the recently discovered phenomenon of "knowledge relining", by setting up pilot relineries in selected

pecting nation.

Symptomatic of the disease is a passion for one-shot aweeping remedies. We may well prefer those werse 100 years' deskilling of fac-

Martian information structures

Figure 2 in the last Privateview contained a few type araphical errors.
The last three lines in the top section of the table should be cread:

the plant of papers (position successors, value)) close

print(value(inputposition)); goon]

Due to a postal strike in February and March, 1971, publication of Computer Weekly was suspended for alx next few weeks, our Tan Years Ago column will be replaced by "Fourteen Years Ago" excerpts from Computer Weekly's news columns in the first full year of publication.

(To be continued) Honald Take frequently) is service team.

MODCOMP has joined the growing number of computer manufaci
threes to announce implements
tion of the three levels of the X23
Interface recommendation is in circuit, switched data networks
in the product, a combination of hardware and software for use with its Classic minis, is to be available from April for \$4,000 per computer.

Univac recently announced

support for both X25 and X21, the interface recommendation for use interface recommendation in the classic interface recommendation in the classic interface recommendation in the class in the class int

SYSPAK

The distributed computing pro

puter service departments).

A POWERFUL DEC ® BASED RANGE OF SYSTEMS DELIVERED AND INSTALLED COMPLETE, NEW AND FAST

EG: SYSPAK/780

VAX (11/780 CPU + 1.5 MB MEMORY LA 120 (1) 180 CPS CONSOLE 2×256 MB DISC DRIVES 800/1600 BPI MAGTAPE DRIVE 16 LINE MULTIPLEXER 12×VT100 (COMPATIBLE VDUs 900 LPM LINE PRINTER , VAX/VMS (1), V2 OPERATING SYSTEM FULL MANUALS, SYSGEN ETC. INSTALLATION + WARRANTY

(EQUIVALENT DEC (SYSTEM = £206,300 - 27% MORE!)

CALL FOR DETAILS OF THE FULL SYSPAK RANGE

EK NORTH FINCHLEY LONDON N12 0AZ

01-349 2911/4 01-349 9267/8

TELEX 8952836

*Delivery and Inatallation Prea UK & Eire only

Registered trademarks of . Offered subject to Digital Equipment Co. Ltd.: continued availability

lerminals Chailigh cum Hardy Manchester M21 261 Tel. 081 881 0757 CONTROL YSTEMS -1 10(4): 687151 MCS G 4h floor, Billion House, 60/58 Uzbridge floor, Edifor, Impion 1/5 21, 1 of 840, 3292

PRICE CHECK! SEEIFYOUT CAN BEAT USFOR OFF-THE-SHELF VALUE DELIVERY * SERVICE THROUGHOUT THE UK. VT 100 E895 LA120 E1595 PLUS Hazeltine & Tally ANAGEMENT: 289:271 Barlow Mogr. Road:

FOURTEEN YEARS AGO

From Computer Weekly of February 2, 1967

THE first computer to go into over a thousand Buil-GE emperation for the Netional Gomputing Centre's heavy headquartains in Manetester. A systems research institute where systems analysis from Europe can study the subject to advanced postgraduate level, is to be set up by BM, in Génevs. The Buil-GE crisis in France worsened when armed security guards held back.

coping ratio, has progressively eroded it in other respects, in particular by deskilling life inside the factory while adding to its complexity outside. Subdivision of tesks into idiot sub-tracks and their subordination to the appropriate in the progressive in lination to the assembly line has turned each job into one which moron. Most painful of all, the trained man sees the craft to which he devoted his life "rationalised" out of existence.

Prnfeseor Danald Michie

is head of the Machine

Intelligence Research Unit at Edinburgh Unit

tory work, and in particular to end

Advanced technology, while in

some respects enhancing men's

the tyranny of the assembly line.

Treat a man like a moron and you make a moron. Yet for a steadily growing proportion of the working week, each man so treated is confronted in his off hours with another job which gets herder all the time - the job of everyday life. The land 1 job for more an

Here then is the rub.

Even the NCCL head girl Paul-cia Hewitt would find it a cha-

MANCHESTER

Ref. No. W-CPB/Q2

Constable, Greater Manchester Police, Computer Project Sedgley Park Training School, Prestwich, Manchester M25 B.H.

> Univac recently announced two years.

righer lever protocols, such as for ille transfer, are being the veloped, too, although marketing vice president. Jim Jordan said fore the Ethernet specification was judgermann Bass would implement any proposals published under the Ethernet scheme by Intel, the cable level, by boosting the Digital Equipment or Xerox. This company took the view, Jordan said, that everyone should into 48 bits. Modcomp's X25 software

of microcomputers, so the Eighties is predicted to be the decade for

applying them. The ball has al-

ready started rolling with the de-

velopment of a microcomputer-based har management system, called Micro-BAR.

Micto-BAR was designed in the UK by Stephen Weich, managing director of Schmiero, based in Lun-

A company called Micro-BAR UK has been formed specifically tu

market the system, and to take

care of all its associated future de-

velopments and extensions.
Weich's aim was to bring the

microcomputer to the small busi-

nessman in a dedicated manner, so

that it would have the lesst psychological effect and not too many

disruptions to the running of the

He has succeeded - the system

csn be operated with the push of a

button to obtain a real time status

of stock for up to 128 different

Stock data esn be accessed by

nisnagement; the system does not require a bar tender or even a com-

puter person to operate it.' Stock

control is carried out automatically

by an electronie transducer connected to each optie, which passes

KIDPILUAN

TEACHING MACHINE

8 88

APPLES

Magazine's cool reaction to '1,000 free pages on Prestel' offer

BRITISH TELECOM has offered 1,000 free pages on Prestel to the magazine Practical Computing for it to publish telesoftware, but the reaction from the magazine has been cool. "We would luve to du it and no doubt we would eventually du it anyway," said editor Peter Laurie, "but right now there would be no financial benefit for us, only the hassle of keying in the

programs."

If has asked the Department of Industry to fund the inputting function. The Dol is considering

The Council for Educational

COMPUTER SCIENCES in the

US has been allowed to resume

bidding for new government

contracts despite the legal action sgainst several of its employees for

allegedly defrauding the govern-

ment when selling time sharing services un CSC's Infonet net-

dardised formats and procedures for storing and loading telesoftware on viewdata systems, fol-lowing discussions it initiated last September with manufacturers in-cluding IBM, Research Machines, Commodore, Tandy and ITT. Mike Brown of CET said that

there had been some contention over errur control methods, but finally it was agreed to recommend the same parity checking method that is used in Prestel's bulk up-

CET is now tackling the prob-

overpricing Infonet services and

March 11, 12 & 13, 1981 — Wembley Conference Centre, London

Have you booked in yet for

Britain's leading microcomputer event?

Exhibition — see the latest microcomputers, peripherals and software

Conference Sessions — Share the experiences of those who are professionally involved

on more than 100 exhibition stands.

In the design, development and application of micro-based systems.

• Professionel Development Courses — Get to grips with microprocessors

and their application in three one-day courses run by

ICS - the leading training company.

March 28, 1980.

feehnology is about to publish a set of recommendations for standern for schools. The target price is under £100, which might be met by hulk ordering from suppliers of proprietary modem boards or television adapters, but none of the products so far on the market can be used without modifications or additions.

> on Prestel were first run by CAP in have yet emerged and most interested parties, including the Prestel organisation, regard telesoftware as important for the long-term rather than the immediate future.

Computer Sciences back in business with US govt

The US government's ruling has been warmly welcomed by CSC business hidding that remains which derived 63% of its total time sharing is the one area of new business hidding that remains elosed to the company. Infonet business from government hrought in more than \$44 million from government business in the contracts in its fiscal year ended last fiscal year, although this sum The government is charging the CSC employees with deliberately

was atill relatively modest com-pared with the remainder of CSC's

Management is Typewriter conversion vital factor in micros for industry

IBM GOLFBALL typewriters ean now easily he converted into printers, using an attachment from Data Resources that fits inside the typewriter case with no substantial modification. A set of eight small solenoids act on the clutches inside the typewriter, providing a standard RS 232 interface to a small computer or

Tha price of the conversion unit, made by Eseon of Santa Barbara, starts at £420, depending on what Interface and options are required. The character set is determined by a repla-

All the electronies are in a separate box; the only modifica-tion required to the typewriter ease is the making of a hole for

alone accounts for about 40% of CSC's total US government busi-

Earlier this month a Federal judge dismissed the most serious charges against the CSC personnel.

> rovided with the report. Some of the firms studied for the report were small, some large, some experienced, some relative neophytes, but none was a com-plete newcomer to microelectron-

> > The conclusion of the micros project was announced at the CSA quarterly lunch by director-gen-eral Doug Eyeions, who added that the related Text Processing project, in carrying on its work, was pressing hard to the DoI and

MANAGEMENT commitment to

the importance of new technology

is easily the most important factor

in introducing microelectronics into industry. That is the finding

of the study, just completed, oo micros in manufacturing carried

out by the Computing Services Association for the Department of

Visits were made to 120 firms,

and the study looked at applica-

tions for micros in process control,

in products, and in information systems. Project leader Gerald Janes, of John Bell Computer Ser-

vices, said that average success rates jumped from 40% to 80%

provide guidelines for their work.

management were elearly

committed to the work, and this protect the network from equipwas the main message of his report to firms thinking of taking up the ment failure. Commented CSA president Alan Thomas, "The Bill gives BT a free range to be inhibiting" on A draft of the report is oow being considered by the DoI. The intention is that the final version will be given to all firms that apply oew developmenta. He com-plained that British Telecom was all too ready to give speedy apfor MAP funding from now on, to proval to its own oew de-

Consultants taking part in the MAPCON scheme will also be dawdling over others' proposals.

Thomas is meeting information echnology Minister Kenneth Baker this week and will raise this

velopments auch as Presiel when

terchange standards. The main concern of the CSA st the moment however was the Telecommuni-cations Bill, now in committee stage in Parliament.

stage in Parliament.

The Bill in its present form was not nearly as liberalising as it

should be or as the government had intended, Eyelons said. It was far

too restricting in giving British

Telecom a monopoly of any value

added services that it was even

contemplating going into

Eyeions complained, and type approval of oew equipment would still be too complicated, he said

Instead there should be licensing

of installation engineers, with a

"company fuse" on the wires to

Doug Eyeions also spoke of the voluntary training council planted for the computer industry in place of a statutory body and which has now been approved by the Man-power Services Commission al-though it does not yet enist officially. The council is a cooperative venture with the BCS, its NCC and the IDPM, and two ser-

Chinese 'shopping trip'

A DELEGATION from Chinese universities is to visit the UK Computing Services Association next week as part of a "shopping trip" to obtain equipment and ad-vice as part of \$393 million scheme to develop scieotifie and technical education io China, The money is a promised loan from the World Bank which will be divided between chemistry, engineering, physics with electronics, and com-Specific facilities for which

test centres, key isboratories, and their visit will also be meeting UK manufacturers and staff at walversities and polytechnics.

CSA director-general Doug

Evelons also announced that a trip to Japan is being organised in con-junction with the Loodon Chamher of Commerce. Japanese hardware manufacturers continue to be very interested in UK sol-

Chaps to go live in 1983

• From front page

wish, the difference being that a bank will deliver the paper to its own clearing bank which in turo will transmit the transaction information via PSS to the clearing bank of the payee bank, a method known at credit clearing. Town Clearing uses dehit elearing where the paying bank delivers the paper to the bank being paid, which in turn hands it to its elearing bank for clearance with the clearing bank of the paying bank.

The new Chang will dea each learning bank of the paying bank.

a bank to phone the transaction to its elearing bank or access the clearing bank's system using a simple teletype link or its own computer. Access will also be possible via the Swift interbank funds transfer network of possible via

somputer. Access will also be possible via the Swift interbank funds transfer network of possibly via Another benefit will be the availability of identical same day availability of identical same day hardware being installed by the clearing banks will be Non. Stop multiprocessor kit from Tandem, and the basic software for message control and transaction auditing will be developed by Logica under a contract worth at less! \$200,000. The auditing software will main tain records of billions of pounds worth of transactions every day.

Tandem kif was chosen not only of its reliability but also for the systems software supporting the systems software supporting the clearing bank and live on air clearing well as the Bank of the Royal Bank of Schland. It is the Bank of the Royal Bank of Schland and the Giro.

ler elearing banka sharing machines.

The Chaps attering committee rather than Logica itself will retain management control over the whole project:

Chaps users ean "shop around" for a clearing hank that offers the best service and it is envisaged that in future users will include a lot of big commercial organisations is A major advantage offered by Chaps to the banking industry a

aoy size to be handled on a same day basis where rapid clearance is needed. With Town Cleating the min mum transaction size it

bus.

microcomputer every time a drink Weich, one to two weeks' turnover of a typical company, or an invest-The problem of attaining an ment of 2 to 4% of annual electrical signal from an uptic

whenever a drink is dispensed has heen sround for some time. Weich claims to be the first to have solved it. His method requires a special encapsulated optic including the standard uptic and the electronic monitoring device, which is being made in the UK by Lucas Indust

Racal Microelectronics Systems, of which Weich is a director, is assembling the system. It causists of two brief-case sized units, one of which is housed in a brief case and called ADAM (auxiliary data

Now the micro takes

bar in your local pub

over behind the

Adam contains a keyboard and a thermal printer so that individual lines can be accessed and a printout obtsined.

Custom designs

The choice of memory is left to the user. Micro-BAR operates us-ing two sets of RAM memory (up to 64K capacity); a cumulative memory and a resettable memory so that information can be obtained in sn instsnt after certain

The time interval is unlimited and Weich is prepared to consider custom design using more than one resettable memory. The system is battery backed, and can keep 128 lines going during a

power failure for up to six hotrs.
Weich's ingenious method of
obtaining an electrical signal from
a dispeoser to monitor the output flow can be applied to other products sold in a public house, hotel or catering house.
Weich is working on monitoring

pub games, cigsrette vending machines, food vendors and fruit machines. He is also haviog talks with butchers, newsagents and betting shops.

The cost of the basic Micro-BAR system with up to 25 dispens-ing points in £2,500. Extra dispensing points can be obtained for £100 apiece for up to 32 in total and £85 apiece for over 96.

Winchester disc based system for under £5,000

A. WINCHESTER disc based microcomputer system selling for under £5,000 has been developed by South Walas OBM systems up to 2-megahytes of storage. A company, ComCen Microcomputers. The system runs off a Zilog and this is expandable up to 256K-eight-bit microprocessor; the bytes. The system runs the S100 by South Walas OBM systems elght-bit microprocessor, the Z80A, and uses Westero Digital's CP/M single-user and MP/M.

multi-user operating systems.
ComCen was set up by brothers
Peter and David Norman, who also run a computer shop called der £5,000 to the education marComputer Centre, in Swansea.
Now, at the £1 million a year
turnover leval, the company has Peter; Norman told Computer
organised a systems assembly plant Weekly that the company will be
In Swansea occupying 4,000 looking at Microscope's Unix looksquare feet.

In Swange occupying 4,000 looking at Microscope's Unix look square feet.

The plant became operational last October and is now producing about five systems a month. The company hopes to double its producing duction by next month.

The 20-megabyte Winchester discusses yield by Data Recording in the UK by Data Recording Equipment, and Comcen has built the controllers. The IBM Winchester fechnology was used in the design of the drives which have a transfer rate of 6.4 megabits per ist in 6MHz versions thus enhancement in the performance of 280B-indiliseconds.

Twin eight-ineh floppy disc drives are used as back-up to the Wineliester discs and can provide

operating system: ComCen is selling eight-user systems for un-der £5,000 to the education mar-ket, but it is also alming at the OBM and scientific markets.

turnover. The system can also he

If Adam is needed for a particular application, this is an extra £525. An RS232C interface is supplied with it for access to teleplione lines.

Expansion Adam has room for much ex-

pansinn: there are four blank keys on the keyboard and rown fur extra printed circuit boards. Micro-BAR is already installed in several locations on a trial basis. The first customer, Courage, installed the system last March and

ries. The specifications required were for less than a 1% error in 5,000 dispensations. Micro-BAR schieved zero per cent error in 5,000 dispensations. Other interested customers are

Allied Breweries, Thwaites Brewery and the Grand Metropoli-ian Group. Systems are soon to be installed on a trial basis at Bass. Many interested customers are

asking for specific expansion fseili-ties such as programming on-site, inventory control and checking stock levels. Weich expects to be producing expansion hoards for the system at

a rate of three nr four a year. At the moment Micro-BAR is being released only in the UK.

A STATE OF THE PARTY OF THE PAR Staphan Welch of Salmicro with the Micro-BAR bar management system.

Acorn Computers buys Orbis

A ULL D

DEVELOPER of the Reconct networking system, Acorn Computers, has bought out Orbis, owner of the marketing rights to the Cambridge Ring. Orbis will carry on trading as before, but Acoro will effectively control both major small systems networking techniques.



8/16 bit arithmetic.
16 x 16 Hairdware multiply and divide.
Multiprocessing capability, 2.5 K on chip ROM (8072, 8073*).
64 bytes of on-chip RAM.

98073 ROM includes NIBL Busic Inletproter.

The National Offensive for the 80s.

National
Semiconductor
THE DUERT'S AWAID FOR TECHNOLOGICAL ACHIEVEMENT 1980



The Nuthinal Semiconductor (UK) Ltd. Sales Office

WEDNESDAY 11 MARCH

Ksynote Addrésa Chaimtea Howard Kojnelein, injet UK Local area nelworks — a inbiger of acropuler and communications lectinologies

Local area natworks — a interior of accinuter and communically feetinglogies.

6 C Bass. Vice President, Ungarmas in Sass. USA.

Distributed Problessing.

C hairman: Howard Kortelein, Intal, UK.

Microprocessor in a significated propagating a diwork.

P.M. Jackson. Modular Business Systems. UK.

Illustributed professing. — the role of the interligent peripheral.

In Distribut. Zipo, UK.

An oppusson is apacial-purcose multi-microprocessor systems.

I.R. Whitworth. Royal Militars College of Science. UK.

Chairman. David Dack, Howlait Packard. UK.

A low cost self-contained support system for the Inter 1920.

T Wardle, A Karim E. D. J Oppumpy, Koughbordugh University of Techsolegy, UK.

The MAOIC micro development lettle.

David Dack, Howlett Pablard' UK Innsulgos for reat time embeddes microprocesso systems Nettona: Composino Centre, UK/ A FORT AN Opogram sulles for musicocomputals Systematica: UK

Techsology, UK.
The MAOIC micro development lectility.
R B Vaupto, SPL Intal hallonal Respondent Centra. UK.
The design of a antwersh inferron coessor development
R Green, Blassdala Computer Systems, UK.
Software.

D Powya Lyone, MAL Lid UK

THURSDAY 12 MARCH

tees Bludise
Rairmas: Andrew Colin, University of Shalholyde, UK
Amicra processor-based enalyser for is irracranial pressure recording
If Chambers, Newcostalis General Hospital, UK
Sysiam desigs of dots ecquisition units for micraprocessor systems
M J Taylor, University of Liverpook, UK
Orgital de le handling of unaleady escodynamic phenomens
If Fescock, DK Oss. J Ford & C J Koffy, Crantield Institute of
Technology UK

Cornelle Bolowell, Migro Soliware Unit, Regional Computer Centra, Baili University
A raylew of the inited bardwere and soliware development a
Marropomiosta se for the subinegemana.

What I reprise. Betting from Bervices. "To go it sides with a micro." Guidantes to I hat Desensamen planting to go it sides with a micro. "Make I souther. Heavist hat Machines Limited.

The midre is heavist hat his protection on the reason in the hadron of the hadron are not the protection." The protection of the ways Shillsh Medical Association.

The protection as spot plant hat can be a seed in anchoraging the wise of the protection of the ways of the micro. The protection as spot plant as spot protection of the micro. Confidence of the micro. The protection of the micro. Confidence of the micro. Confidence also described as the good protection of the micro. Confidence also described as the good protection of the micro. The protection of the micro. The protection of the micro. Th

implitie, agramma, mantan an equational, assumpty, aurey implitie, cos are reducing the ode of computer aided lesining by loss and impresemptions of first series. Editor Predicted Computing a Plica, modeling, simulation, reliverking,—the sky s tile limit (computer) and loss of the sky s tile limit (computer) and loss.

Technology, in,

Training
Chairman, Andjew Colin, Lintversity of Strainctyde, UK
A self-techning couse in infrograngeasor-based produr
W & Malhason & C A Hitchonock, Open Liniversity, UK
A microproceasor learning cystem
A singer, Eat. Instruments, USA
Elitective use of infrocompalets in schools
J J Tumbuit, National Computing Centre, UK

FRIDAY 13 MARCH

All Thirmir Centre, Horne Lane Beithing MK 40 HTR. Tel.: 11234/47147 Felev: \$26209



10 1 7 H

IF you seriously want to get Into hualness as a autware huuse or a micro manufac-turer, here are some of the

difficulties you may face: If your company has turnover of £50,000 and you poy yourself a salary of £10,000, here is what could bappen: Salary £10,000, PAYE £3,000, NIS £1,000 (you + company). Net to you: £6,500 approx.

Your company makes a profit of £20,000, after your salary and expenses. You have to meet corporation tax of

Out of what is left you are meant to provide the finance for your company, the govern-ment having taken nnt 34% of the profits, but 34% of the

There is not enough money grow bigger, so you wil bave to borrow. . .

IF YOU GO TO ONE OF THE HIGH STREET BANKS, YOU MAY FIND:

No risk capital; immediate repsyments of interest and capits; a second mortgage on your property; loans on shor terms of two to five years. A merchant bank is funda mentally not interested in start-up situations or com-penies with less than £500,000

Growth area squeezed by the banking system

feced, day by day, by people in our industry trying to start up on their own, were brought into the open et the Sunday Times conference,

try, with one or two notable excep-

tiona, continues to report record

profits, both here and in the US.

The number of vacancies in it con-

tinues to outstrlp the supply of people to fill them.

Yet here in the UK, there are only six companies wholly engaged

in computing that are listed on the Stock Exchange.

This tiny presence can be put down to any number of causes, but

there were a series of points made at the Sunday Times Banking on Britain conference which appear particularly relevant to the UK fin-

820 K.S.R. or R.O. 150 C.P.S FULL ASCII STANDARD

the Thirties. Dole queues have almost reached 2.5 million, and the stockbrokers Green and Co. Of the

further 500,000 jobs will be lost in industry in the computer indus-However, the computer indus-

The six companies listed on the Lever, the millionaire former

FROM TI SUPPLY

SILENT 700 THERMAL PRINTERS

forecasts this week that a other 44, most are part, sometimes

industry, employing about 750 people. But the parent, NatWest Bank, employs 70,000 people and

Center-file's 1980 turnover wss

£13 million compared to Nat-West's total assets of £28 billion.

tion, particularly in the growth of

computers, was traced at the con-

ference to a series of shortcomings

in the banking, tax and social

minated by the alleged failures in

systems. The conference was do-

The conference was called as the result of two articles written for

the banking system.

Part of the reason for this situa-

Benking on Britain. From the highest level of the benking end government world comes the news that from the tex you will heve to pay, to the emount of money you cen

UK, fully one-third of those funds, about £40,000 billion in all,

is lodged with the building socie-

ties as sbort-term deposits, lent out

for periods of 20 to 25 years.

according to Lever and Edward

is to leave us with an industria

base where the average age age

Germany, Jspan and the US.

825 R.O. 75 C.P.S.

s the average age of equipment in

Computer Weekly associate aditor KEVIN CAHILL was at the conference and examines here some of

THE UK is moving into the depths of the worst recession since also appear on the list of 50 comwhere more than 85% of homes

have no directly connected sewage. But the price of this good housing stock is being felt most sharply by services at the Post Office. Put in its simplest form, the first of the Lever-Edwards articles with good homea and no sbowed that, for every pound invested in industry in Britain, Japan invests three pounds in Japanese industry. But there is more to it than that. Taking all the funds available for investment in the

If ICL had been able to borrow on the same basis as the average owner, i.e. two and a half times gross income, we would have nputer giant with over £1.7 billion in funds, lent on a relaxed 20 to 25 year repayment term. Instead we have a computer pygmy struggling to survive on total loans (banks and shareholders) of a puny

What this bas done for Britain, Lever and Edwards classed all oon-investment expenditure as consumption. On that basis they equipment is 35 years, twice as old made the following five points: 1. A much greater proportion of national product must be rein-

The UK has good housing, probably the best in the world, and certainly better than in Japan, 2. British industry has to raise most of its investment capital from its own (highly taxed) profits. In Japan major finance comes from outside the company, and German entrepreneurs can raise three times as much money from the banks as the Beielek.

AVAILABLE NOW DATA-TERMINALS EX-STOCK Britain's banks lend comparatively little to industry. . Japan'a industrialists have

really long-term loans of 15 to 20 years. In Britain the formal term

5. In Japan the debt equity ratio is 85. In Britain it is 22. (The debt equity ratio is the amount of money per £100 that a company must find outside its own reagers to keep abreast of the se schemes and respond in as a couraging and sympathetic ways But all through the informal discussion which followed est

In the second article Lever and Edwards argued for a series of changes in the proportion of money being channelled from the three great fund-gathering agencies — the insurance and pension funds, the banks, and the building societies — to industry.

The reaction

-Following the publication of the denied reaction from the public.
The banks, in the form of Nat-West chairman Robin Leigh Pem-berton, leapt into print. He at-tacked the Lever-Edwards attitistics on the ground that they were ten years out of date, rather than dealing with the principles raised, and, with glorious injudiciousness, alleged that no industriality who were rialist who was a customer of the National Westminster Bank had ever complained to him of being refused a loan which, in the cus-

tomer's view, was affordable. The following Sunday the S The following Sunday the Sunday Times carried a series of letters from Nat West customers flatly contradicting Leigh; Pemberton. So vocificious was the criticism that the Sunday Times that the Sunday Times fixed up the conference to allow the protamists to debate their differences

banks are changing. If you are high technology outfit you will ge preferential treatment, deceives on the right terms and must more ventore capital will be available.

The tax system will change a allow small companies to retain in more of their profits, and their will be a much more advantages tax treatment of PAYE employed wishing to offset high technological investments desired tax.

KENNETH BAKER, the information Tachnology Minister. Then is now a new spirit abroad, Meney's more readily lent in the City and a

in public. The following point

Having had their ritual con-

back against Lever and Edwards

the clearing banks are moving in

to develop ways to get more mose faster to industry. The loss wilbe for ionger terms and the secutivy demands will be lower.

In the case of the Midland Bank.

e general manager indicated he whole branch structure we

being looked at and in some case reorganised to deal with the pro-

gave an assurance that any resec-

able proposition from a compour

company would be given a ma-

pathetic hearing at the Midded Information Terbnology Mis-ter Kenneth Baker said: "I do n

member myself bow difficult

was to raise money for high ted

nology investment from either its

three or four years ago. But then is now a new spirit abroad, Most

is more readily lent in th City at

"It is important for branch mis

apeaker, the same theme emerged What the banking generals were

saying was not, in all cas, reaching the branch network.

range of people with compact backgrounds spoke of ignorme-excessive collateral demands, no

viable repayment terms and a ser-eral apathy towards small firm

propositions. One would be con-

puter entrepreneur spoke of I

branch manager seriously taking him what kind of fibre software

One bank manager at the out-ference, with a clutch of large

high-technology companies on his

books, spoke of a branch network

without telex, Prestel or access it computer modelling facilities.

Buf there is no doubt that the

ems of small businesses, pertin

computer companies.

emerged.

Settled out of court

IBM has now only to deal with pending appeals from three other ptivate anti-trust litigant Mamores. Foro Premion and another leasing firm, Transme.



Boeing homes in on scientific market

centrate on what we feel comfort

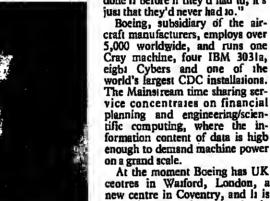
The new Boeing subsidiary

tends to increase its share of the

US time sharing bureau Boeing has bived off its ICL bureau and thing with the part of the business he knows best, while we can consoftware marketing arm in the UK, and is now concentrating on winning more customers for its US-based scientific and engineeriog service through a new subsidiary, Boeing Computer Services

Peter Hooper, former managing director of the UK branch, bought out the part of the business. which was based on the Capital Cities ICL bureau acquired by Boeing five years ago, and also the specialised airline software, and the Prime interactive business

"There hasn't been any bad feeling about this desl," saressed Boeing's new managing director, George McLeod, "This is Hoop-



... as ICL bureau, software arm split

was the best year to start a business," Hooper commented on the split, "but an ioternational crisia is a good time to prepare for the future and I expect an upturn be-fore the end of the year."

The business which had developed out of Boeing's Watford buresu, now called Hooper Systems & Technology, HOST, had looked like taking the US parent in a direction it did not want to go. Boeing had decided to concentrate. concentrate on its mainframe-based time sharing service, and the allernstive to the split was to close down a business which had grown to 80 employees and a £1.7 million

In addition, Boeing had started to include the division's products and services in package deals with sircraft sales and wanted to stop it selling to rival aircraft manufactur-

likely that there will be premises in

rivals did not prevent Bocing from helping the new company on to its feet: of the £500,000 involved in setting it up, about two-thirds has come from Boeing — to fund the purchase of three ICL MB29s and to provide working entits! to provide working capital.

li is to be repaid out of profits. Hooper, as chairman and manag-ing director, will hold 70% of the equity, while two co-directors, Stan Packham and Steve

. Plans for this year include coovering the ICL 1904-based batch processing services to run or ME29s, adding online capability and selling the application software used by the bureau, includ-

Comal demo at Bulmershe

"The use of well structure languages which are simpler t use than Basic is a fundament

Know-how added to German logic

before" say the adverts for CPG, a teleprocessing language which is promising its US users that it turns batch programmers into TP pro-"It is knowledge of what goes on in the machine combined with straightforward German logic,' grammers overnight.

CPG (sold in the US as CPG)

... The language) is being pushed hard in the US by Insac, and is about to be launched uver here by Altergo. Like most Altergo products it is aimed at the IBM market, with the stress in dow/CPG interface, which enables users in keep the same program

"Effectively, it saves you one programmer a year," said Calvin King, who is marketing CPG in the UK for Altergu. "There are also benefits in increased pro-grammer productivity, high scientific time sharing market by taking advantage of the lower cost of such computing in the US. "We can sell at US prices," said ystem performance and a reducion in training.

Altergo came across CPG three pay here and as they're eight hours or four years ago when selling its TP monitor Shadow II tu a Geraway in time, it means we get night shift rates as well. nau customer, Renker Dason KG, "Times are hard and it means paper specialist subsidiary of Rutrthat companies aren't growing as fast, so they are looking around to do the same amount of computing ing. The firm had written the language for is own use after discover-ing that its IBM 370/125 "died" but more efficiently - they have to contain costs. They could have done is before if they'd had tu; it's dien programmers tried to write

TP applications in Cobol.
Unable to find people to write in

from CICS to Shadow He moved from the back room to the sharp end of marketing

Aftergo snapped up the product gets for CPG. "It's basically aimed at people who are short of TP proand has been grooming it for commercial consumption in the last two years. King himself was involved in writing the Sha-

gramming resources," he explained.

crack the Lobol market. "Cobol programmers don't like the threat of being 'deskilled'; they tend to say 'the kind of things we partly because of his faith in the product, and identifies several farneed to do can only be done in Gobol', but in fact once we've overcome that attitude they find CPG does it more citiciently.

The price of CPG is in the re-"One significant market we've gion of £10,000, and includes identified is System 3 to 4300 manuals, support, and one year's

l i ne numb		indleators				indlea	tors	Lytes slorar
	typ			operation code			cocsient	uned
70	C		AA (TAG			FAG AAL	400000
80	C			EREADSLREEN		Gl		200035
90	Ċ			EREADSCREEN		95		*****
10	Č	NPt		GOTO AAL		•-	JAA OTGD	****12
t0	č	•		AFOOTARR	AVR	5u	•	*** [[] 4
20	č			Z-ANOO	t	20		004024
30	č		LOUP	TAG	-		TAG LOGP	****
40	č		t	J DOA	T			0 0 0 0 4 2
50	č		ARR , L	SUB AVR	ARE, I			9.0036
60	č		1	COMP (2		12	211	434342
70	č	10	•	GOTO LOOP		•	GOTO LOOP	4040[2
06	č	• -		EREADSCREEN		ÜΖ		000032
190	č			SETOF			tt	****
00	č			GOTO AAL			GOTO AAI	*****

A typical CPG logic spac, for reading an array from a screen. The spac type, C, here indicates a calculation

Next week is INFO WEEK

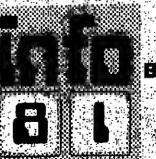
Britain's biggest ever Information Technology Show is at the Cunard International Hotel, Hammersmith, London, next week from Tuesday 10th to Friday 13th February, open each day from 10 a.m. to 6 p.m. (Friday 4 p.m.)

See and discuss the latest developments in computers, word processors, telecommunications, microfilm equipment and information retrieval systems from 80 exhibitors. Admission is free on registration.

INFO '81 is organised by B.E.D. Exhibitions Ltd 44 Wallington Square, Wallington, Surrey SM6 8RG Tel: 01-647 1001

INFO CONFERENCE LATEST

There's still time to register for the INFO '81 Information Management Conference, starts Monday and all next week at the Gloucester Hotel, London. Telephone 057 282 2711 for details.



THE FOURTH INTERNATIONAL BUSINESS COMPUTING, WORD PROCESSING AND INFORMATION MANAGEMENT EXHIBITION CUNARD HOTEL, LONDON

Make it your business to come!

and DP units the best possible deal impact printers and thermal printers is the latest VDU range

BUSBLE MEMORY TERMINALS

of Texas Instruments Limited, now offers systems designers, OEM's in data terminals Supplementing to ensure you get what you want it, at the best possible brice.

Ti Supply, the distribution division

810 R.O. 150 C.P.S.

The full range of Texas Instruments from ADDS. And they are all available including all options and accessories, acstock with all the backing of Texas instruments

ADDS VDU'S



























A PHONE CALL AWA

Charle on the season of the ballet Supply Call us at Slough (0753) 3341L Tx 848363; Manchester (061) 432-0645. Tix 667478, Bedford (0234) 67466; Ext 3493, Tix 82178

Ti Supply, the distribution division of TEXAS INSTRUMENTS LIMITED

A PRIVATE anti-trust suit against. BM which has been as protracted

IBM which has been as protracted as the government's marathon case has been settled out of court, with IBM paying Greybound Computer Corp \$17.7. million;

The leasing subsidiary of the famous hus company first filed its suit in October; 1969, demanding \$100 million damages; a figure that could have ribied if Greybound had coded in the burright winner.

A joint statement from IBM and Greybound said that the case, due to start on January 26, would have lasted several months and involved aubstantial expenses on both sides. The \$17.7 million paid to Greybound will cover part of the ex-

penses it has incurred to date.
In: 1969 Greyhound charged
IBM with trying to menopolise has
leasing business with tactic like
manipulating its own purchase and
lease prices.
Greyhound has now withdrawn
its charges with prejudice meaning that it can never reopen
the case.
With Greyhound off its back.
IBM has now only to deal with

rica.

Meanwhile, the US government's and trust action against IBM is expected to teach the red diet stage early this year.

OVERWHELMED by the response to his recent article on Contal (Software Flie, January 27. They are Max Bramer of the Open University and Peter Ross of Edinburgh University, as well as Atherton himself.

Three computer educationalists will discuss and demonstrate Comal, Logo, and other computer at computer and other computer and the computer and t

HOBBY: ROBOTICS

Amonthly newsletter in desociation w Hobby Robultas of America for lichnician and developer... ubechinion Cl 8.60 par atinum The Edich 124 Forest Road Tumbridge Weits Kenn

atructured programming in schools suggests that the time may be ripe for a breakthrough in software almost as far-reaching as the bardware developments of 1977 and 1978," commented

step forward for computer

Dejails of the Beyond Baale conference are available from the College at Bulmershe Court, Woodlands Ave, Rarly, Reading RG6-1HY.

COMPANY NEWS

sistance will be provided."

Both the MSC and the NC

gear their school-leaver projects to

the gathering of experience so tha

students do not approach first em

ployers totally "green". The experience angle is particularly in

on 061-228 6333.

DEC stays healthy, but DG profits dip

Digital Equipment and one of its biggest rivals, Data General, show that DEC is maintaining a healthy profit and turnover growth despite the current economie uncertainties, while DG is struggling.

Business in Europe, which grew by 55% in 1980, is now feeling the effects of the recession like the US, according to DG president Edson

For the second quarter, ended December 27, of its current fiscal year DEC recorded a net profit of \$70 million, 30% up on the same quarter of the previous year. Turnover between the two quarters saw a 38% increase in \$762

In cuntrast DG's results for the first quarter, ended December 20, nf its current fiscal year show a turnover up by only 14%, at \$156

juny's previous standards.

Pre-tax profits fell from \$20.1 million over the year to \$16.1 million, while net profits before extraordinary gains slumped from \$11.9 million to \$8.7 million. This igure was boosted by \$5.1 million as a result of DG selling balf its 320,000 shares in digital telephone exchange builder, Rolm.

Data General's problems appear to he concentrated at the low end of its product line where OEM business is said to be flagging due to the financial problems of many OEM eustomers.

In Europe about 65% of DG's business comes from OEM sales to small commercial systems houses. The company does not release figures for Europe on a quarterly basis so it will be necessary to wait million, compared with the until the end of the year to see by fell from \$22 million in the first turnover of \$166 million has been quarter of fiscal 1980 to \$20.5 million in the 1981 first quarter, a figure that provided DG with an turnover of \$166 million has been

Honeywell expands production

HONEYWELL has followed up its excellent 1980 results with news of 1.6 million square feet of additional production capacity being built worldwide.

About 70% of the expansion

will take pisee in the US, but the Honeywell General Systema Division factory at Hemel 120,000 aquare feat. This is for increased production facilities for the Level 6 mini and the DPS small busineas ayatem.

In the US, Honeywell will add 50,000 sq feet for increased capacity in the custom integrated cir-cuit division. A further 175,000 sq feet will be for mlero and memory products at Santa Cruz.

Cray climbs

A 50% RISE in profit and a elimb of 70% in turnover at Cray Electronics have brought the company close to the £10 million sales barrier. Profits for the year just ended were £345,000 before tax and turnover was £9.8 million.

Hint of tax boost for investors

tion Technology, to the Sunday Times! Banking on Britain conference, was a clear hint that the government is giving serious thought to changing the tax regime for vestors in small companies.

The importance of any change to the computer industry eannot

At the moment only two 100% Stock Exchange listing. These are ACT and ICL.

In the Unlisted markets there are only four 100% computer companies: Seandata, NMW, Rolfe and Nolan, and Quest Interna-

Yet the computer industry as a whole is on a 29% per annum growth eurve, recession included. The implication is that the computer industry in the UK is dominated other by parent companies in businesses, or foreign com-

sector, particularly in the computer industry, was the absence of the kind of inherited wealth so prominent in the financing uf new

computer companies in America. Baker attributed this wenlth to "the very generous tax treatment of American personal incomes over the century." He said, "One of the things we must try to do is to ereate the conditions where that

still working, and defect a investment from PAYE. wealth ean be built up." **CDC** computer growth

Data grew by 23% last year compared with an 18% growth rate for the eompany as a whole. Computer business brought in \$2.8 billion while another \$1 billion was contributed by the firm's financial services subsidiary, Commercial Credit. But that aide grew by only

Net profits for the company overall saw a 17% increase to \$150 million, while net profits from computers jumped 28% tu \$92

For the fourth quarter of 1980 net profits saw an impressive 50% increase to \$36 millium, but total revenues for that period grew only by s sluggish 6% to \$1 billion com-pared with the fourth quarter of 1979.

prise Board-owned Du Recording Instruments. Univac orders up 8 per cent

UNIVAC, which accounts for nearly half the turnuver of Sperry Corp, chalked up a turnnyer in the third quarter, ended December 31, of its parent company's 1981 fiscal year that was 16% up in the same quarter of fiscal 1980. Onlers placed were 8% up on tite previous year while order bucklog saw a 10% increasa.

Sperry publishes no mnney figures for its individual divisions but the third quarter results for the company as a whole show a 16.7%

milliun and a turnover increat 12.2% to \$1,338 million. No profit and turnover figures for it first nine months of 1981 and increases, respectively, of Ish, to \$220 million and H.IS is \$3,880 million.

rinlist said he would be more ing a £40,000,000 invertment ing a £40,000,000 invertment in soon as the tax change in 5. Budget were known. The more would be used predominant; in finance new computer.

The kind of tax changes

pected, or hoped for, at the which will allow individual;

builds very large mainframe, the

service bureau operation and a largest OEM peripherals manual

The UK side of Control

chalked up a tumover of me than £130 million last year, he

terests io the UK outside them

company include Control Date

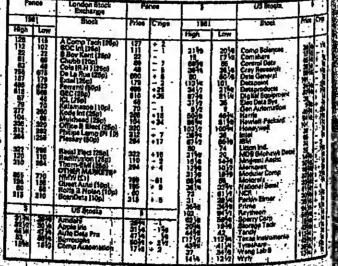
the supplies manufacture of Data Peripherals of Sureas which builds printers for paneers that the control of th

Peripherals, the disc drive mir

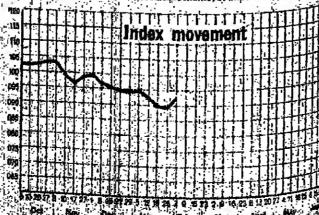
facturer in which Control Del aubsidiary, Magnetic Penseul Inc. holds a large minority del The rest is held by National East

Sperry has also published figures for the year to Decake 31 which show net profits will 18.7% at \$307 million and turnover Increase of 14.7 1

CW SHARES TABLE



	The delite of
	The table shows the closing prices in London on Friday and in America on The
1	The share index is based on the prices of the UK companies in the label had
	TOWS have been express and one business of the CV combenies in the
	Lows have been adjusted where necessary. Shares dealt in, in the United Securities Market or under Rule 1st [2](s)
:	The state of the s
ı	
1	TROUTE TO THE THE TANK THE TAN



OP SPOT

VDU

victims

write .

Computer firm offers helping hand to a city's dole queues

TW() responses have been re-ceived to Op Spot's nationwide op-peal for VDU victims in come for-

Firstly, a gentleman phuned to say that ten yesrs ago a Dutch friend was being driven to distraction by a whistling screen. The irritating noise was coming from an IBM 2260 compatible VDU made by Philips.

Sensitive

Apparently the Dutchman was one uf the few people who are sen-sitive to 20 kHz sound and although no one else could hear n thing, this man's sensitivity meant that he could. The majurity of people hear frequencies up to 15 kHz and telephone lines unly carry up to 3 kHz.

Portunately the VDU was in a double glazed third-floor office so that Keeshonds and other Dutch dogs weren't set to howling by the silent screech.

The second response was not from a victim but from a lady who sent a photograph which, at first glance, appeared to be promotionsl msterial for Mothercare. Huberta Kingsbury, of Automation Facilities, writes: "We have a VDU screen cleaning kit to reduce the risk of errors and eve-strain caused by imperfect visual display.
A quick daily wipe and VDU screens are free from dust, finger

Among its other lines, the War-grave-based firm has a product recommended for 'teleaning

lem is particularly acute in the arc fewer now, there will be big Liverpool area where une in three demand for staff of all kinds when the economy picks up.

school-leavers is onemplayed. Ron Kennedy, marketing man-Liverpool was so shocked by a newspaper report that 4,700 schoul-leavers were chasing 12 weeks and KBS was paid a training jobs, that he decided to join forces fee. Most aspects of computing with his local Manphwer Services were covered, and two weeks were Commission and give a helping spent on operations.

"Data processing," he says,

Calling all Scots ops

HAVING recovered from the exeessea of Hogmanay and Burns' Night, could Seota ops help me out oo two counts?

Firstly, I would like to arrange some North of the Border site visits during March or April. Since I started my stint on this page I haven't been north of Northampton so I'd like to get in some travel before I'm accused

Secondly, an op from the Deep South, Chessington to be exact, ness area. He has been working for over two years on a site with an ICL 1906, an ICL 2960 and an ICL System 10. If anybody in Inverness has any suggestions I'd

'Going Dutch' is not so easy now

IOBS in Holland for British nationals ore out as easy to find -. nor as profitable - as in the past. This is particularly, the ease for contract operators.
Holland, like everywhere else,

has been affected by the recession and about one in ten Dutch workers is unemployed. Foreign contractors, even if their skilla are in demand, are never welcome against such a backdrop.

'21 per cent drop'

Dutch taxation has become atiffer. One agency said that three years ago a £7,600 Income would hove had deductions of 14 per cent. Now those deductions would be closer to 17 per cent.

In the past it was possible for British nationals to be pald half in the UK and half in Holland for a period of 183 days. Apparently the Dutch outhorities regarded this as a loophole, and have now lowered the time to three months.

The strengthening pound has also had the effect of diminishing contractors' salaries. P. H. Clifford managing director of Industrial Arlists, polots out that, "In pound terms there has been a 21 per cent drop in salary since 1979." In June 1979 there were 4.3 guilders to the pound New there guilders to the pound. Now there

are 5.2.
All that said, there are still jobs for ops in the Netherlands if you kecp your eyes open. For example recently there was a post in central Holland for a Univac 90/30, 90/40 operator with OS III, advertised at .seofg 000, 62

Haggling

When finding a job in Holland, do anywhere else abroad, there are several points worth remembering

bear in mind that they look at contractors with all the sincerity of a bea constrictor contemplating its dinner; Obviously they are working in a competitive market so to some extent their interests will be your interests; but don't be swept away by apparent friendli-

"If you know you are valuable says one op who returned from Hollaod six months ago, "it's worth negotiating." This advice is borne out by the refusal of ageneies to quote general rates of pay, which suggests that the agencies expect to do s blt of haggling.

"We don't work to any strict

sets the legal minimum rate of pay. For a 24-year-old console operator this / legal minimum is 28,000 guilders, which is an annual grosa of about £5,600. called vakantietoestag which is ar eight per cent on annual gross holi-day payment due to all Dutch workers. Having been in Holland for three months you will be con-

sidered as a Dutch worker and be liable to the same taxes and bene-

Jittery

Once you have found out low much your basic salary is and where it will be paid, discover the value of the various allowances which will be promised. These range from relocation money to the on-taxable alements one agency has negotiated and put under the Apparently representations cover hair-cuts and manicures!

But the market is not healthy at the moment and the agencies are nor the MSC makes any promise of

sponsored by the MSC's Youth Opportunities Programme. They were paid £23.50 a week for 14

No promises

KBS runs an IBM 4331 operating under DOS/VS, and the schuol-leavers spent seven days on the theory and practice of ops.
They learnt simple replies to messages, and how to change tapes.
They also spent a day studying library procedures and two days in scheduling.

any VS system: They

also speak common

compular languages such as COBOL, RPG II, BASIC end

FORTRAN, What's

lion bytes of main memory.

llon bytes of storage and up to 2 mile

businese-oriented

try a wide range of pros so they learn something about data processing and employers know that they are not complete novices."

employment for people who have

completed the courses, it is worth

noting that nine of the 14 who

attended the recent Liverpool

What is promised is that

kids gain work experience and

practice in the ways of a computer room. The MSC manager, Peter

Rimmer, who takes eare of Liver-

pool's Youth Oppurtunities Programme, says: "The KBS course

gives young peuple the chance to

course now have jobs.

people have a theuretical knowledge of computers, but once they leave school they lack the facilities to put what they have

work experience schemes where a company takes on a person between 16 and 19. Similar to the shorter courses, the employee earns a deduction-free £23.50 a

week, and the company has someone for n othing. Rimmer says that any companies interested in participating in the work experience project should contact him on 051-236

ter users, and the idea is that

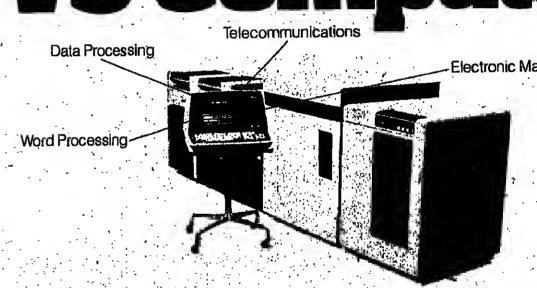
trainces will he in a position to

decide on a starting puint for a

career in computing. Again there is the warning that, "while there

portant in operations, much of which has in be learnt from exper 9200. The MSt?'s London number Although the MSC and NO rs 01-836 1213. project can do little to change the The National Computing Centre in Manchester has a similar kind of project for school-leavers called horrifying statistics of job loss and restricted opportunities, the the Data Processing Threshold are a retreshing contrast to point cians' vague pledges on compute Scheme. It lasts for ten months and students are paid £26 a week. awareness. The courses consist of classroom training and working with compar-Awareness has limited valu

Someone in the cab of a runawa from Stephenson's Rucket to the 125. If nobody has shown when the brake is and how to use it, the awareness counts for nothing.



If you're teking steps to your most demanding epplication at e automete your business, hera's very undemanding price. Let's fece it: what you're looking for e way to take a lot of sleps at once the Wang VS computer. While most systems on the market performane or And productivity is what Wang is all about. Iwo functions, the Weng dala Wang (UK) Limited, Weng (UK) Limited, Weng (UK) Limited, Weng House, 100 George Street, London, W1, United Kingdom, Unite processing, word processing, electronic mail and single workstation. VS computers otlar full expendebility because the same applications software lits:

Yet with all this sophieticellon, Weng more; VS systems support up to 128

VS odmpulers are amazingly simple workstallons and include up to 4.6 bit to use. In fact, programmers and office personnel can become productive in e single day.

And the VS computer can handle



Making the world more productive

ComputerWeekly brings you

COMPEC NORTH'81

MANCHESTER BELLE VUE

JUNE 23-25, 1981

For better communication with the heart of industrial Britain

The sponsors and organisers of COMPEC are proud to present the first extension outside London of that event — the largest, most comprehensive and most visited computer show in Britain. For details,

To: Compec North, c/o IPC Exhibitions Ltd., Surrey House 1 Throwley Way, Sutton, Surrey SM1 400 Please send us more information about exhibiting at COMPEC NORTH.

Company

Catalogue

shopping

computer

ARE you up to the proverbial mo-lars with shopping? All that pre-

Christmas trudging about weighed down on ooe side by

enough brussels and spuds to feed

ao army, and on the other by a 10-

lb turkey representing your Christ-

mas Day entertainment - verily

the modern beast of burden is

woman. And this was followed by

the slings and arrows of outrageous

January sales 10 save pounds off

that aheer you've been putting off

If now you feel you can never

and let your fingers do your

walking for you. Not through the unrelieved sobriety of the Yellow

Pages, but vis the glossy colour pictures of a msil-order catalogue.

Order Line

While there is nothing new

about catalogue shopping, Free-mans Mail Order of London has

smoothed out and speeded up the whole business by incorporating a

telephone line and interactive com-

Called Order Line, the process

starts in the conventional way with an agent taking details of a customer's order. The agent-person can then ring a relatively local number

and speak directly to an operator seated at a VDU, who will check

the availability of any of the 20,000 items on offer in the catalogue,

and, hopefully, reserve the order.

If the particular item, colour or

size is out of atock, a second choice

can be made, or the whole order amended on the spot, avoiding the

sometimes lengthy, or even shor-tive, to-and-froing of the postal

Nationwide

Bob Shemmings, a director of

Freemans, told me that by August 10 Order Line would be

nationwide, and employ 100 termi-

nals operated from five computer

The fourth centre has just opened, linking up parts of East Anglia, and the West Country and South Wales are to be included in a

At present agents with London, Birmingbam, Sheffield, Manches-

ter, Peterborough and St Helensphone numbers can use the service.

Order Line is based on the IBM 4300 range of hardware. Both the 4331 and 4341 are based centrally

and linked to the 100 model 3881

nonth or two.

terminals.

Puzzlet

puter into the system.

buying for months.

ANYONE can see that the job despite Maggie Thatcher market is in the doldrums at the you can quote me on the mounent, even in computing. The classified ads are a fraction of what they were, redundancies are announced almost daily, and letters like J. M. Perry's nu this page are Ectting Dire and mare common

But what of the established conultancy and contract houses? How sharp is the pittelt for them? I approached Harrisons Computer Services, which has four branches: in Loudon, East Anglia, Devon, and Ireland. A fifth is planned but the location has yet to be decided.

Laid off

Richard Mead, one of the direcous, and managing director of the Eastern branch, confirmed everybody's guess. "The market is es dead as a dodo. In my job I have a lot of contact with DP departments from a whole range of companies and the difference from just a year ago is ataggering. Projects cheduled for the next few months have been indefinitely posiponed, or cancelled outright. Staff are being laid off, in some cases whole DP departments are closing down, and I know personally of four orgautsations in the last month where the computer managera were asking about jobs with us."

I remarked that he would have no problems in finding staff - at least he'd be well supplied with DP managers,
"Absolutely. In fact we always

get a very large response to our advertisements from all over the country, the North and Midlanda

Expanded

hurried on to explaio some of the background to Harrisons. 'We're in a fairly fortunate position. Thanks to some quite large projects we acquired at the end of year we have actually expaeded in the last few months -

you can quote me on that," he said, beating me to the question.

"We employ analyst/program-mers and have recently taken on two more. The last was e girl from Hurnley who neoved south." I asked about the experience he

looked for and the type of lan-

guage.
"Predominantly Cobol because quite simply, 75% of installations use it. We also get the occasional call for RPG II, Assembler, Fortran, nr one of the Cobol derivatives, and we can usually find suneone as it's our policy never to recruit people with only one lan-guage. We do as much work as possible from our own offices, but there comes the time when the programa must be taken to the eustomer's site and put on the hardware."

Stitched up

What about training — did he believe in taking on beginners, with an eye to the future?

"On the whole, no. We need to be able to get results straight away, and at the moment there are traised people available."

Richard Mead thought cerefully before continuing. "One of the problems is that a trained is not

commercially useful for six months, but ASTMS has autched up DP departments, so that he is paid an inflated minimum salery of around £4,500-£5,000, which at that point he is not worth. It doesn't compare with other indust-

"Having sald that," he contin-ued, "we did take on a trainee last August, but he had graduated in computer sciences, so knew a good deal of the basics — it was just a question of teaching him commar-

With the cut-backs in graduate recruitment from companies like ICL and CAP, there are plenty of good people about. I would hate to be a beginner right now, trying to break into computing."

RIVO TERMINALS

LEAR SIEGLER ADM-3A & ADM-3A+

LEAR SIEGLER 300 BALLISTIC PRINTER

180 cps full specification heavy duty cycle printer

ANADEX DP-9500 & DP-9501.

GRAPHICS ADD ON

LEAR STEGLER ADM-31

TELETYPE 43 TERMINAL

SEIKO GP-80 PRINTER

R.va Terminals Ltd Glendide Park Fernbank Road Asset Betwe

Inkfield Row (03442) 5193 Telex - 847530

HEAST DELIVERY WITH

ULL AFTER SALES SUPPORTICAL



Order Line, the telephone enquiry system set up by Fraemens Mail Order, allows agents to check the availability of catalogue items by telephoning an operator seated at a VDU. Orders can be amended or reserved on the

How do I break into the 'closed shop' of computing?

I WONDER if you can help me. I am a mathematics "minimum of two years' experience required."

How do I break into this apparent 'closed shop'? rently teaching in a secondary school.

For some time I have been considering leaving teaching and seeking employment to computing. I am particularly interested in training to be a systems analyst or analyst/programmer. However, wheo I read through the appointments section of your paper the majority of advertisements contain the magical phrase

Where does a person in my situation (surely I'm not unique), obtain this much prized experience? Could you please advise me how I might echieve these objectives or possibly give me the address of someone who can help me.

Here are my five ideas .

HAVE been asked this question before, and there isn't an easy answer. Only a couple of years ago any graduate, and particularly one with a maths degree, was fairly well sought after to train in programming. Recession has changed all that. Now there are experienced programmers going spare, or if a company is really committed to training, there are plenty of unemployed computer science graduates bout, who have a three-year headstart in the basics and have elmost certainly done some pro-

BL476120

So it is a depressing state, and J. M. Perry has taken on a difficult task. I can't offer a lot of encouragement, but there are five possible things to try;

1. Keep combing the ads and apply for any likely trainee vacancy, even if you are not quallied by experience. This will probably be la programming, as it is not usually possible, or even desirable, to go straight into analysia.

Luck

Write to all the companies within reach that employ com-

From £895

From £495

From £1295

From £1210

From £739

From £776

From £250

puter staff. You may be the right person at the right time. A lot depends on luck.

Be prepared to move to the job - that's what others are doing, even if you return to Stevenage in a couple of years' time when you might ordinarily think of changing your job. Feiling that you have a better change in London if the commuting in feasible.

Teach yourself a language, meanwhile. It could easily take several months or longer to land the job, but you are one step shead if you can offer some programming experience and knowledge of, for example, Basic or Cobol. Both are quite widely available at evening

And this might be your best bet. Take another teaching post in a school with a atrong computer department. Many maths eachers also take responsibility for computer aciences controversial as this is - and they are lergely self-taught. Some posts are advertised in this dual capacity and you may get sent on a course. From there it's less of a jump to fulltime programming/analyaia; breakthrough and emassed

some computing experience, Wasted effort

courses in programming and analysis, but I liestate to recommend these as we have received such a lot of feedback on the diffi-

wasted effort and notepaper,

In addition there are TOPS

CHESS and its 8 x 8 grid has always been a fruitful source of ideas for the puzzle compoaer. On the assumption th virtually every reader of this column will be familiar with such a lot of feedback on the diffi-culties of finding a job at the end of the course. However, it does de-pend on area, and your local Job. Centre could advise you better. Ask about placement statistics. You could go on a course and then, if you don't get a program-ming job, look for a teaching job-you will be just that bit more qualified. he moves of the variou the moves of the various pieces, I will henceforth from time to time include a problem, which involves just the geometric possibilities, with no apecific requirement regarding actual playing ability on the solver's part.

Here is the first of these terms. Place just the 16 White

Here is the first of these items: Place just the 16 White men on the board, in legal positions (no Pawns on the first or eight ranks), so that none of them can move But times are bad, and it is extended difficult for the inexperienced to enter computing. Expent I to take time and a lot of See page 37 for solution.

PEOPLE and EVENTS

Marconi names managing director

MANAGING director of Marconi Space and Defence Systems Arthur Walsh has been promoted to managing director of The Marconi Company. He is being replaced by Dr Ian MaeBean, Space segistary managing director of former assistant managing director ul

Space and Defence.
Walsh was in the Army for three years, before reading natural science at Sulwyn College, Cambridge. In 1951 he joined the GEC laborarories at Standard College. mure in the Radar Microwave group. He became group leader in 1956 and was promoted to divisional leader in 1962. Two years later he became assistant manager of the Applied Electronies laboratories at Stanmore. In May 1970, Walsh was made man-

aging director of Marcini Space and Defence Systems where he was res-ponsible for several of the company's high technology projects including those relating to torpedoes, guided missiles and communication and scientific satellite programmes.

Walsh's responsibilities now extend to several Marconi groups: Marconi Communications; Marconi Railar Systems; Marconi Space and Defence EACH year, Honsywell runs a acheme to succurses operational improvement suggestions. Accepted ideas are rewarded with a weekend holiday book or an evaning out st the thastre, plus dinner loc two. The year thare wece 81 entries, eight of which turned out to be usable suggestions. The winners are pictured shove with Honeywell directors. From left to right: Bob Smith, Bob Msii idirector, linsace and administration), Dave Focrest, Mergerst Wilkinson, Ken Burnati, Brian Long Imanaging director), Mike Mihallovic, Alen Beck, Dovid Youens [personnel director), Ken Thorman and Robin Lock. Systems; Marconi Electronic Devices and McMichael Limited.

Chairmanship of the Marconi Company has recently heen assumed by Sic Robert Telford, director of GEC and managing director of GEC-Marconi.

Logabax appoints president

JACQUES DUMAS, until now president of Sperry Univec France, has been appointed president and general managec of Logsbax, France's leading computer peripherals firm, which was the subject of a £24 million rescue

Logabax's general managec, M. Tai-

Liveware File

I DON'T ENVY THE

vard, has left following disagreement with Electrobel, the Beigian majority shareholdec which holds a 90% stake in the firm. Talvard disagreed over the policy to be conducted over the next 18 months until Intertechnique decides whether to take up its option to win control of Logabax.

CMG joint MD

TERRY JOINT has returned to the

London).

He joined the company in 1969, and soon afterwards went tu work in Holland. He was appointed associate director in 1972 and managing director at one of the company's Dutch subsidiacies in 1973. He moved to Frankluri a need leave to become managing director.

year later to become managing director of what was then CMG's new German

BBC AND ITV WILL



FOR THE NEXT ELECTION .



... HOW MANY SHADES OF PALE DO YOU NEED NOW FOR LABOUR?



DIARY

FEBRUARY 9 Electricity, computers and music. BCS Bedfordshire branch. Cress Mo-

FEBRUARY 10
The Electronic Office, BCS Merseyaide branch. Faculty of Science Lecture Theatre; Liverpool University.

Planned maintenance of factory Planned maintenance of factory plant. BCS Birmleghem branch. Wheatsheaf Hotel, Coventry Kosa, Sheldoo, 6.30,
Computers and the public library. BCS Croydon branch. Maple Room, Fairfield Halls, Croydon, 7.15.

Visit to Robinsoo's Brewery, BCS
Manchester branch. Unicorn Brewery,
Lower Hiligate, Stockport. 6.15. Apply to A. Park os (061) 872 2494.

Visit to British Kail Technical
Centre, Derby, BCS Process Control
Group, Numbers limited, so apply to
Peter Andow, Chemical Engineering,
Dopt., Looghborough University. Dopt., Looghborough University, Loughborough, Lelcestershire,

Microprocessors — the State of the Art, IDPM Hull branch, Hull Crest Hold, Farelby High Road, North Ferriby, North Humberside, 7.15.

Will concrews office be an office? BCS Reading branch. Small Physics Lecture Theatre, IJ Thompson Building, Whiteknights, Shintleld Road, Reading, 8.00.

FEBRUARY 11
The Cray system, BCS Bristol branch, Sr Vincent Rocks Hotel Clif-

Organisation and operation of a DP area. BCS. Hampali | ce branch. Portsmouth Polytechnic, Portsmouth.

The office of the future beyond Buckley.

The office of the future beyond Buckley.

BCS Kingston FEBRUARY 18

Upon Thames breach, Room 140

Data communications in the BighRingston Polytechnic, Penrbyn Road,
Kingston, 7:30.

Computers in banking BCS New Street, London W1, 6.00.

casile-upon-Tyne beaneb. Billson Building, Newcastis Polytechnic.

Computer aided design si Fords. BCS North London branch. West Lodge Park Hotel, Cockfosters, Los-don. 7.45.

don. 7.45.
Joint meeting with BCS South Essex branch and Insurance Institute of Chalmaford. Date! Communications services and Prestel. County Hotel, Chelmsford, 7,00.

Whitber Cobol? BCS Tsesside branch. Tesside Polyrechnic, Borough Road, Middlesbrough, Cleveland, 7,00.

FEBRUARY 12

NOMAD, BCS Advanced Programming Group, Prudential Assurance Co. Hollora Bars, London. Details Peter Prowse, Birkbeck College, Tel: 01-580. Half-day visit to Northwick Park, Harrow, BCS Medical groups System X and its software, BCS On-

FEBRUARY 13 Annual dinner dence, BCS Belfast branch, Culloden Hotel, Belfast, 8.00.

ford sub-branch, Statt Collee Louis Oxford Polytechole, 7.45.

KEBRUARY 16

Acquisition and retention of computer personnel. BCS Cheltenham and Glos branch. Queens Hotel, Cheltenham. 7:30.
Microprocessors. BCS Glasgow branch. The Music Room, Staff Club, University of Strathclyde, John Street.

FEBRUARY 17

Social, evening, BCS Chester and North Wates branch. Greenall Whitley, Warnington, 7.30, Details A. Bewley, Holly Cottage, The Communit, Buckley,

Lamsac official dies

Management Services and Computer Commuteet longer serving officers,

Peter Sanderson, has died at the age of He graduated from Heriford College, traford in 1961, and began his career in computing with Univac and NCR, working in customer training and systems envirteering for clients in manufacturing companies. He also set up the training and education section

Service
Following a period as senior lecturer
Following a period as senior lecturer in computing at South Thames College and as extra-mutal hieturer for the Uni-versity of Southampton, he joines Langue as a computer advisory officer in 1970, covering a variety of datter from cost accomming to computer adot design, and advising on producment, stating, organisation and feasi

OEM director promoted

Michael Dyson has been appointed manager of technology services by Redifon Computers. He previously spent two years at the London Business School and his involvement in the industry has included working for Decea

toc, at the company's headquarters !

FORMER director of Logabax OhM activities. Paul Bion has been promoted to managing directive. He has been with the company for six years, having spent most of his caceer with NCR, Univac and the Rank Organisation in a variety of sales and prefuger. tion in a variety of sales and mistrage

Grahem Kemp has been appainted to the new post of sales and marketing director at Marcol Compiner Services. Ile joins the company frant PRC where he was Hurapean macketing manager. He has also worked for Unidate and Huneywell Bull.

Cyril Teed has left his post as msc-keting director of Marconi Commu-nications Systems to join Plessey De-fence Systems. He has been appointed to the new position of marketing direc-Alno Clemmesten has been appointed director of terminal product man-agement and corporate development at Mannesmann Tally. He joined the company seven years ago as European



Midwich Computer Company. He for-medy worked with Lucas Micus on an intamutive project.

Thomas Harlnear Iras been appain-ted vice-president and controller at Informstics Inc. Ife was formerly as sistant controller with the company.

Colln Croft has joined AB Dick as



leading supplier of magnetic medie. Main frame businesses know there are strong reasons for relying

Main trame pusingses know their a are strong reasons for reynth on Control Detaset, Such as the system/drive/head/medie total technology capability of Control Deta Corporation. The exclusive supply of CDC and ICL label products. And the backing of Britein's biggest sales and technical support force.

CD Alpha and Omega label and ICL label products are.

exclusively manufactured et Control Data's U.K. plent, allowing full control over production and simplifying delivery

So rely on the leading brands from the major supplier

Call 0438 3399 for all your magnetic tepe requirements. or write to Control Datasat Limited, P.O. Box 16, Argyle Way, Stevenage, Harte, 601 2AB.



Versatile 150 cps matrix printer range with high density graphics depability

Gives full vector drawing with complete Tektronix Plot 10 software cepability

The famous 'dumb' terminal (over 1,500,000 sold) and its bigger brother

Two page display with full editing capabilities and four visual attributes

Popular 30 cps terminal available as KSR, RO and paper tape ASR

Lowest cost, smallest sized 80 column impact printer in the world

At IBM, the passing of the year hrntight with it the changing of the guerd, os Frenk Cary stepped down on the compeny's chiof executivo officer. Taking his pleco is John R. Opel, IBM's president mains for C since 1974. Meny observers end analyste take place.

of the world's biggest computer compeny believe that the 1990s will be e decisive decade for IBM. While Cary has act the stage for several crucial changes, it remains for Opal to ensure that these changes

The changing of the guard at IBM.

SINCE Frank Cary took over as IBM's chairman of the hoard and chief executive officer in January Displaywriter, IRM's first soft three competitors, Storage Technology communications scene has changed drastically. These were years of significant developments in the semiconductor husiness as well as years in which IBM faced, for the first time, tough competi-tion from the likes of Anidahl, National Semiconductor and Sinrage Technology.

Both Cary and his successor as chief executive, John Opel, worked their way up the IBM hierarchy through the company's Data Processing Division (DPD).

Timing

Cary has been with IBM since 1948, when he joined the company as a marketing representative in the Los Angeles DPD office.

He became a member of the IBM board of directors in 1968, IBM president in 1971, and chsirman of the board and chief executive officer in 1973. Last Derelinquished his position as chief

Peter Krass

Cary will retain his chsirmanship of the IBM board, with his seat as head of the IBM Corporate Office, which represents corporate management to all of IBM's opersting divisions.

The timing of Cary's retirement is due to IBM's attitude of encouraging executives (even the

couraging executives (even the chief executive officer) to retire at 60. It follows that Opel will hold the top spot for five years at most. He will turn 60 in January 1986. pel began his career with IBM

1949 as a sales representative lo in 1949 as a sdies representative to Jefferson City. Missouri, and has been with the company ever since. In 1972 he was elected to the IBM board of directors. Two years later, in 1974; Opel became president of IBM as well as a member of the Corporate Office. He was elected to his new position as chief executive officing as March His now need the 1979, that ended IBM and only 1981 went into effect on Jan markedly lower price performance ratios for small markedly lower price performance

Under Cary, IBM brought for ward several new and different products and triplored new markets and marketing techniques. General Systeins Division (GSD) and Office Products Division (GSD) and Office Products Division (OBD) obtained retail outlets during the late 1970s. And In the area of large mainfrance and peripherals, IBM became a truly aggressive force, responding to the rise of its inflators, the comparible machine makers.

OPD, during the Cary years, indeduced a series of electronic typowniers, the 50,60 and 75, that hridged the gap between electric

typowriters, the 50, 60 and 75, that hridged the gap between electric typewriters and full-blown word processors. The machines, intho-duced in May, 1978 (the 50 and 50) and in Detaber, 1979 (the 75), meorphysical varying amounts of

that the Displaywriter announce-ment was IBM's way of playing catch-up with the rest of the industry, at least in terms of technology, its competitors responded nervously to the announcement with price cuts on their older lines. GSD introduced two key pro-

ducts during Cary's reign, both of which struck out in new directions and both of which have heen relative failures so far. One was a small database machine, the S/38, announced in October, 1978, and first shipped In June 1980. The other was a minicomputer, the Series/1, which IBM announced in November, 1976, and began

shipping two weeks later.

Many computer industry ohservers believe that IBM's slow

manufacturer.

1BM's biggest division, DPD, had a straightforward task under Cary: to beat its imitators. As Sanford J. Garrett, computer stock analyst for New York brokerage Paine Webber Mitchell Hutchins, puta it, "The further evolution of the microprocessor broke down the microprocessor broke down the microprocessor broke down the entry barriers. The result was unprecedented competition."—specifically from companies in cluding Amdahl, Hiachl, Magnusson and National Semiconductor. Many of these companies were able to market superior machines at lower prices. And if they didn't at lower prices. And if they didn't, they couldn't compete at all:

Clobbered

In the mainfedine business, IBM

markedly lower price performance ratios for small maintrames. Users

ware-driven word processing

solngy, Coatrol Dats and Memorex, were able to challenge iBM in this area, IBM's recentlyannounced thin-film hesd disc has thrown them off a bis. The development costs associated with the new discs have proved to be large. The competitors are now struggling to match the new IBM products - and to do so in a umely rashion

The race will be tough. Should the pace of the new disc installations grestly exceed that implied by 1BM's initial delivery schedules, the competitors will be in trouble. If IBM falls behind its promised pace, the outcome favours the PCMa. And if IBM sticks to its plans, it appears that the competitors, at least the leaders, will survive.



pany's work.

that IBM will unveil two addi-tioosl lines during the 1980s, the Sierra and the Olympic series. These will be machines that may replace current IBM lines and that, in terms of processor speed and power, msy go beyond today's

Ouring the Cary years, DPO also discovered that frequent changes in mainframe purchase prices can keep the competition off-guard. For example, prices on the 3033 were cur three times during 1980. When iBM cuts prices, the others must follow suit. And because IBM has a lot more money to play with, it can better sustaio any resulting deferment of profit. Another important move was

Another important move was IBM's partnership, along with Aetha Life & Casualty and Comsat, in Satellite Business Systems (SBS), a high-speed data communications service company. SBS launched its first of three satellites in mid-Mosseybar 1990.

proclaimed industry gurus, believe that Cary's most significant accomnent was to set the stage for IBM's entry into the Eightics, often at the expense of short-term growth for the company. For one, that meant clearing up at least some aspects of IBM's dispute with the US Justice Department and lawsuits from competing com-panies. These legal hassles had a detrimental effect on the com-

Harry Edelson, head of Wall Street firm Edelson Technology Associates, says, "Cary's best acnew businesses, such as selecommunications, minicomputers and word processing. He made short term sacrifices in growth with hope for higher growth in the Others, such as Robert Fertig,

8100, the S/38, the 4300 (which he says, was underpriced) and the Series/I. And during the past five years, the company's growth tale has dropped below 15 per cent at

"The question is, can Opel get a back up?" Fertig asks. Most observers concede that is IBM's new chief executive, Opel will have his hands full.

John Grey, president el Technetronic Inc, an Onlarobased consultancy, says, "You're going to see IBM regain its pre-ence under Opel. The company will try to surround its four grey walls with excitement; it will be come more speculative."

Grey points out that IBM's ners are unbappy with the company's take-it-or-leave-it attitude.

"IBM has to become more reactive. The market is more sophi-ticated; IBM may have to specialise io order to sell: specialised markets. If it doesn't h will lose business to hungder,

Many computer industry of servers believe that IBM's slow start with these products will not mean that its future in these areas is hleak. During the 1980'a, IBM's street. Some industry analysts asy, are both likely to become strong influences on the data processing influences on the data processing influences on the data processing industry. And GSD's small business systems, such as the S/32 and S/34, did very well, being closer to what IBM's customers were used to getting from the questions unanswered

One of the more interesting commentators on IBM's strategy is Paul Raynault, vice-president of Computer Financial, a New Jersey lessor and a purveyor of computer residual value forecasts. In an interview Rayonult said that IBM's numbering of the new machine may be a hint at the company's future plann for the unit.

Precedent

ratios for small maintrames. Users and other vendors assumed this all forthcoming computers from the company would meet or exceed these machines' officiency. This has not yet happened, but all of IBM's older model mainframes gor clobbered on the used manket.

Realisation that IBM's strategy at the low end came too late. The leasing companies and the compering yendors, both of which had a lew good years, must now live with a much less stable situation. And IBM's rivals in the non-compatible computer game are now forced to catch, up to IBM's pricing. The alternative for the ent is possible loss of least sompetitors loss their base on IBM, history has shown, that base on IBM, history has shown, that base on IBM, history has shown, that base on a similar design in the succession. According to Raynault, the 3XXX de

WHEN IBM announced the model 3081 contral processing complex last December, the first reaction of industry observers was that a many rumours would be laid to rest. These rumours centred on a widespread belief that powerful computers, the so-called H-series for the 1980's.

But now that the dust has settled on the last unout that the dust has settled on the last sold as initially announced — bas left some key questions about IBM's strategy unanswered.

4300 line. IBM's smaller meinframes can hehave much like thair predecessors, the 370 series, or they can act in a similar fashion processing instructions, the so-called native mode, makes 4300 suries machines more powerful. The usar of such a machine may have to pay a price in tarms of learning to use the different instruses and, in some cases, in terms of a reorganisation of programs running on the computers. But IBM has made the pay off for the user once the transition has been accomplished. series, or they can act in a similar fashlon peculiar to themsulves. This other way of processing instructions, the so-called native mode, makes 4300 suries machines more powerful. The user of such a machine may have to pay a price in tarms of learning to use the different fustures and, in some cases, in terms of a reorganisation of programs running on the computers. But IBM has made the native mode efficient anough, in its view, to pay off for the user once the transition has been accomplished.

A similar stretch.

been accomplished.

A similar strategy on the 3081 (or 4381)
would not be unthinkable. Should that occur,
IBM would most likely introduce new feaand perhaps even a new operating system that would enable users to get a lot more work out of the new large mainframe in return for their additional investment of manpower and, possibly, fees to IBM for vendor annual of causes.

industry sources, IBM will hegin adipping industry sources, IBM will hegin adipping 3081 machines to selected usars under its so-called Beta Test program. Between then end the October date on which computers will officially be dulivered to customers, IBM is expected to ship as many as 75 of the large computers.

the US Rather, IBM wants customers around the world to get a chance to use the around the world to get a chance to use the new computer and report their experiences to the manufacturer before the official shipments begin. Further, IBM will want to gain experience with its new chip packaging technology. It is unlikely that chip failures can be repaired in the field. If a 3081 breaks chip oarrier (MCC) of the user's site and repair the old component at special facilities where machinery capable of removing and replacing the chips would be syallable.

To make the transition easier, IBM might have to support 3081 configurations in which one of the two main processors runs in 378 and operating difficulties of the capability of any IBM operating system software yet announced.

leased to users. The pricing changes of the past faw months have led to an interest on the part of users renting from IBM to refigued their computers via independent lessing compaoles. These lessors can offer more favoure paoles. These lessors can offer more favoure bie monthly rates than IBM, but they typically require a commitment from the sate for three years or looger. The result of the refinencing is, for IBM, an increase in the sales of systams as opposed to rentals; it is also bringing a windfall to lessing companies.

been accomplished.

A similar strategy on the 3081 (or 4381)
would not be unthinkable. Should that occur,
IBM would most likely introduce now features and perhaps even a new operating
system that would enable users to get a lot
return for their additional investment of manpower and, possibly, fees to IBM for vendor.

Some users may soon learn about any enhancements coming on the 3081 first-hand.

When IBM announces its shipment
achedule for the 3081 this pattern of IBM
loass to third-party leass conversions and
ohange, If 3081 machines are available
promptly, users may choose to stay with IBM
lease that offer, in ruturn for higher rates, and
option to return the computers earlier than
the four-year nominal lease term. Even with
the panalty charged by IBM added in the
panalty charged by IBM added in the
computers saffer than
the four-year nominal lease term. Even with
the panalty charged by IBM added in the
supplied features.

Some users may soon learn about any enwith lease to third-party lease conversions and
obtained to the conversions and
obtained to the sole of the 3081 machines are available
promptly, users may choose to stay with IBM
lease to third-party lease conversions and
obtained the four-year nominal lease term. Even with
the panalty charged by IBM added in the
four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with
the four-year nominal lease term. Even with When IBM announces its shipment

in the 3081 might bave on software competible vendors like Amdahi Corp and National Semiconductor are not yot apparent. It is possible that the differences between 71 mode and neitye mode on the 3081 machines will not be so dramatic that the hanker of compatible systems are fruit hadly. Amdall, at least, has the freedom to littlewe it new The Beta test sites are not to be confined to 580 asries, also called Oslo, by altering microcode.

If it's a question of which terminal to choose, we'll give you The TOTAL Answer

It isn't just that we supply high quality terminals from leading manufacturers such as DEC, Hewlett-Packard. Tektronix, Diablo and Texas Instruments - there's much,

For a start we've got branches throughout the UK with full demonstration facilities and technical staff to advise on the most suitable terminal for your applications.

Next, we offer a very flexible rental scheme, with or without a Purchase Option, which includes on-site maintenance. This gives you the opportunity to evaluate equipment prior to purchase and upgrade any time without penalty.

Alternatively, if you decide to take advantage of our competitive sale prices, we'll give you a full 90 days warranty.

Finally, our Service Group provide Maintenance Agreements for all equipment in our range. These cover you for not only routine upkeep of equipment but act as an effective emergency service to minimise computer 'downtime!

To find out more, contact your nearest branch today. If you've got any questions, one phone call could give you The TOTAL Answer



Address

Centrei Scollend 0501 43162 Aberdaen 0224-25301

Düaasidorf∙. Toronto New York

Anaparate and the second of the second secon

Process control trend to the distributed method

tions are heing reported for comprocessing industries, a rather vague term covering chemical, and silied physical, activities such as

are being made in batches - in contrast to the continuous flow processes characteristic of the big efineries - computers are found to show great advantages in controlling plant in which many different products are made at dif-

Contpared with other electronic and electromechanical devices for automatic control, computers also offer flexibility for changing process conditions quickly and aimply, while keeping batch records, monitoring both directly measured parameters and also those needing calculation such as the yield or the heat transfer coeffi-

December, 1980 the North-Western branch of the Institution of Chemicel Engineers heid e symposium entitled Making Computer Control Work in the Process Industries, DR ISRAEL BERKOVITCH attended the symposium, held in Menchester, and reports on it for Computer Weekly.

Dr Berkovitch is a consultent in chemical technology and aditor of SCI-TEL, the ecience megazine input to Pres-

The most important attribute of ven box with manual switches to computer control applied to batch aimulate input cooditiona, lamps processes, as seen by those operat- to simulate output actions, and

WEST CENTRE HOTEL, LILLIE ROAD,

FULHAM, LONDON, APRIL 1-3, 1981

MORE TIME The show this year has been extended to a THREE DAY EVENT

MORE SPACE — Over 30% more stands for you to view

Peripherals 81 is the exhibition for professional purchasers of computer

The exhibition will feature the latest in terminals, VDUs, printers, plotters

Entrance to the exhibition is by registration at the door but you can obtain.

Surrey House of Throwley Way Sutton Surrey SM1 4QQ

*Please note applications received after March 16, cannot be accepted.

graphic displays tapes and the disc drives and other memory products.

Save time at the door

Peripherals '81 Tickets IPC Exhibitions Ltd

Send for your FREE *advance tickets to:

equipment. It is an event at which those responsible for acquiring computer

equipment, whether they be original equipment manufacturers (OEMs) or computer

users; can get together with equipment suppliers to discuss their requirements

TO DO BUSINESS

in the relaxed atmosphere of a specialist show.

operators varying alightly in their practices may produce differiog re-

Brian Steel of ICI's Mond diviaion comments that experience of several projecta applying control of batch processes by mini- and microcomputers todicates that it is feasible to train in-house cogineera, process managers and technicians in computer techni-ques so that specialist staff do not need to be brought in. But of course a sprinkling of computer experts readily on call is desirable. sequence control programa are

Figuro 1. Overoli control system arrongament timers and potentiometers to simubatch plants. Attitudes bave late continuous measurement" evolved on these plants partly as a

though he describes himself as a con-computer specialist, Birkett reports designs for cost-effective

THE

PERIPHERALS

ASSOCIATION

INTERNATIONAL

SUPPLIERS

SYSTEMS

Process stages I and 2

result of experience and also because of chaoges in the relative costs of hardware and software. A plant designed in 1976 was controlled by one system (Digital Equipment PDP-11/35) in a re-

more control room with a stand-by control and a background system to collect data and prepare software. Though this method is successful there were important problems, notably in developing the system software and in the effort required to schieve the final

As a result, a second plant conaisting of a single multi-purpose unit will be controlled by a DEC PDP-11/23 with 128K i6-bit



THE SHOW THAT GIVES YOU MORE TIME

process stages, the product of the stage feeding in to the next - s the first of this company's batch operated plants to be placed full under computer control. Robert Doig states that the factory is words of memory, and oo stand-by; it will have dual floppy discs to collect batch record data and load There is a background computer on site where floppy discs can be taken by hand and the control room is now 3 metres from the ocarest plant. The control room will not be continuously manned but if there is an alarm, the com-puter will activate a bleeper carried Fach system comprises a cosing processor with a 128 K word memory; a fixed head disc for day storage, a dual floppy disc sing for back-up data storage and system product and a s

by the operator.

In the latest plants, a noteworthy treod la towards a distributed

Ten years'ago, computer process control was usually carried out by a single CPU. Connected to this were disc drives, magnetic tape units, card reader/punches, tele-printers, VDUs, analogue inputs/outputs and digital inputs/outputs. To avoid the right nputs/outputs. To avoid the risk inputs/outputs. To avoid the risk of abutting down the process if there were a failure on a disc drive, a dual computer system would have to be installed. The distributed approach to computer control schemes for processing is described by B. Cessford of Digital Equipment.

described by B. Cessford of Digital Equipment.

Data processing and management functions are still handled by a central CPU, called a host. But process interfaces are connected to separate CPUs; each coorrols a different section of the plant and operates independently of the host. Consequently a disc failure will not disturb the working of the CPUs responsible for process control. testing and commissioning.

organisation of good local maintenance facilities and spares for the computer system by outsider it the factory maintenance teams.

Introducing a review procedure to discipline and approve proposed changes to computer tasks. Thus this report, like other indicates that the use of computer in controlling chemical plant on be successful if adequate styand studies and preparation are made but that success is not anomalo.

control.
This trend is likely to continue, says Cessions, using these reliable.

level languages allowing programmers to develop application programs far more rapidly. But course security of communication ootsely between the plan control CPUs and the bost computation.

name of a Hooeywell system (TDC

alarm tag oumbers, equivalent monitoring up to 1,200 annuaci

However, Glaxo, which commissioned a large batch fine chem-

cals factory last year, based on & sign work that started in 1976, h

enntrolling it by two online con-

puter systems with a third one sapare. Overall arrangement is

allown in Figure 1. Few load contrul loops me provided. But is some areas local logic system carry out simpler tasks like judit

services on process vessels and it

lieve the computer system of some

rudimentary sequencing. The local logic is injusted by the computer

This factory - which has four

been successfully commissions giving "significant and on soin benefits" such as minimising pro-duction staffing levels and local-

ing the most extensive set of salet-features of any of the group is:

ter. Analysing experience with its project, Doig identified these is the key areas needing attention.

• early definition of process to

emplation of a full tyles specification identifying computer hardware arrangements and soft ware tasks to detail, early in the

project;
provision of sufficient eprijenced staff, early, for design, six

testing and commission

tor points every 3 seconds.

2000) allowing operators to invasing the plant conditions simply by pressing buttoon and receiving the result displayed on a VDU. D. G. Twydell sees this as a poweful process controller managemen ystem. There is a basic controlly that can perform up to the control functions, selected from it hardware and the operator in terface is a cable capable to supporting 63 cootrol or monitor ing devices over a highway of the kilometres. Among other feature, the system will scan up to 60 highly irritating.

constructed and frequently illogical. Cliches rule the roost, few stones are left unturned, communication gaps bridged and prime objectives tackled.

The book is based largely on the author's First Computer Handbook, published four years ago and even this revised and heavprogress.
Users are frequently urged to

deal only with recognised suppliers and advisers while tenders and ptoposal formats constitute a third of the book.

Bad news

val merits of the local high street micro atorea:

Sound advice for first buyers

Your Small Business Computers with suppliers. a more specific guide to relevant if the method is wisely chosen too late 256pp. Van Nostrand Reinhold the book cootains the usual technical explanations of computers and

THIS book contains a great deal of software.

The book contains a great deal of software.

To face this daunting prospect to the daunting prospect of small firms considering the possibility of using computers in the early stages may discourage the manager from reading further their business for the first time.

Although written for American him/her to read Chapters 2 to 6 readers. Shaw offers sound advice after the others.

oo preparing for negotiations oo Many managers new to compu-the system required and on dealing ter problems would have preferred

Text book calls for detailed study

bureau.

Checklists in these areas would needs to build up his knowledge of have been helpful and it should be computer systems and their puspossible to present these in a non-technical manner.

In his preface, Shaw says that Contribution to that knowledge.

Automation has the potential for dramatically enhancing business.

Systams Management by Andrew ing their ifp with questions, and ficult to adapt to their situations. Farkin, 168pp, £7.50. Edward Arnold Ltd:

Arnold Ltd:

The first two thirds of tills book to use in death with discussions or in connection with discussions or incomplete the connection with discussions or the head for a fuller treatment of the book MOB (Measure of the book MoB) (Measure of the book with discussions or the first two thirds of tills book death with project control and personal is more discursive and it.

Farkin has produced open in order loshow their relationships theory. MBO (Measure of the book MoB) (Measure of the boo

等。1967年1月1日 1967年 19 1967年 1

This is a pure, for the best of the current oftware engineering literature shows that software maintenance activity is well timdon and Myers and the editor has also con-

Aloreover, planning software projects from their inception with the eventual probave a superficial and slightly gimmicky air lends of maintenance in mind can lead to substantial overall cost reductions as well as ered in this book, which lays claim to being maintenance being made somewhere in the to more satisfying work for maintenance

A owire thoughtful book along such lines It comprises a collection of short articles that the editor sees the problems of maintenwould surely have been more useful than the on various aspects of the maintenance ance and its management as susceptible to

techniques for synchronisation.

On the ossumption that data may have to be distributed, a

variety of methods for locotion

The final section is devuted to

organisational and oconomic

work for aultsequent chapters is

sot by an opening chapter that introduces the concepts of value

and cost, relovant to distributed

Dacentralisation / Centralisation,

Hardware Costs, Operational Coals, and Application Do-

velopment Costa, a brief

what the author feels are the re-

After a serios of chapters on

Filling the selection Introduction to void seen as a distributed computing personal crusade

tributed an annotated bibliography.

Unfortunately, most of the contributions

The book as a whole leaves the impression

'Quick fix' approach to maintenance

In fact, the problems of software maintens - capally by the editor.

ance can be as challenging as any encoun-tered during software development and

coping with them successfully can bring

huge gains in prolonging the life of existing

All these points and many others are cov-

the "first and only buok devoted to program" collection.

gard maintenance work as somehow inferior - previously in various books and periodicals

Buylog a Business Computer by Michael J. L. Turner, 178pp 19.75. (paperback). The First Computer Handbook,

BOOK REVIEWS

tenance, edited by Girish Parikh with foreward by Gerald M. Weinherg, 289

pp. US\$24. Ethnotech Inc., Lincoln, Nebraska.

IF A software product is successful, there will be a long period following its initial release while further work is performed to

correct any remaining errors and add en-

duct has become known as "maintenance,"

and while it is clearly important to giving software products a long and useful life there is an understandable tendency to re-

This stage in the development of a pro-

Hereford.
1NDEPENDENT management consultant Michael Turner ia publisher as well as author of Buyng A Business Computer. The re-sulting lack of editorial constraint becomes apparent as one reads through the book. It also becomes

Sentences are short, often ill-

ily abridged version could have been overtaken by eventa and

Increasingly, however, the pros-pective first-time user limits his

. This aspect of selection does not sppeal to the author; who believes at the selection process should be fully organised and atructured Turner also believes that there is little advice for the first-time user and sees filling this selection voice

dents to provide consultants of re-

as a personal erusade.

putation, integrity and quality. To emphasise the polot, Turner thoughtfully adds his own consul-

Last resort

The book is certainly full of information, possibly too much for many potential first-time business

detached evaluation study; in many cases, it is a decision of last

Selection policies are ofteo

cision to install a computer is not taken as a result of a long, cool and

equipment suppliers. In fact, it is a twilight world as far as professional advisers are concerned, and changed, key staff threatening to Turner has seant respect for most leave and management comlevels of consultancy. ining that their information reorts are as reliable and timely as

an abundance of choice and levels sion checklists would probably of advice in respect of that near give up at the first hurdle and

Accountants are dismissed because of the size of their urganisations and related fees while management consultants are not relevant to the needs of the colo-

Mr Turner emphasises that ad-

vice is essential if the reader wishes

to avoid the minefields, dilemmas and vested interests which stalk

limited to cootacting friendly competitors, responding to direct mail or Press display advertising of computer manufacturers and only on a limited range of suppliets vested interest in follow-up consulhan selection procedures are more tancy activities. System houses also have special relationships with relevant to first-time user needs. The book pays little attention t

selected suppliers and are therefore far from independent, ages, privacy and the ever-present have the practical expertise while elationships wheo new comp teams from parent companies are ystema are being Installed. suspect on the grounds of politics, experience and general interfer-

Even less regard is given to po-tential suppliers. Despite being billed in the index, page 173 stu-diously avoids any such listings. this book. "

There is certainly a need for an informative and Independent guide book for the first-time business computer user. Unfortuna-tely, Buying a Business Computer has more appeal and relevance to the DP manager than the company.

They include node autonomy

puter is needed, what makes a some small businesses are getting good computer application and themselves into trouble whether to buy or rent or use a This reflects the position fairly bureau.

Checklists in these area would needs to build up his knowledge of the businessman needs to build up his knowledge of the businessman.

Aspects of Distributed Computer .comparability; methods of distri-Systems by ifarold Lorin, buting dota (partitioning, replica-286pp. £14.70. Wiley Intersci-tion, etc.), program and control tion, etc.), program and control elements within a system ond

THIS textbook from the IBM ystems Rosearch Institute contains 16 chapters organised Into three brond sections. These three sections serve to logically ub-divide the material in the book ioto Introductory cose studios (Part I), underlyiog principlea (Part II) and organisatio-nal/economic considerations

Lorin gives oo introduction to distributed computing in which be debates the meaning and scope of the term, following this with three carefully-organized

The first describes a banking systèm, the second is devoted to service industry application while the third considers a joint operational/management system.

system (bardware, data, applica-

ions and systams software, ex-

pertiae, management, etc) and looks at overall ayatom atruciure.

Aspects like ohane, distance

maining issues lo distributed on the technical side, these Having described some of the problems associated with DP relate to whether new system atructures are as effective as conory section cods with a chapter ventional ones; here, the require-ment for a auitable comparison aiming to asseas the usefulness of metrics likely to be naed as guidemetrie ia posed. lines to "how and when" (If at all) d approach distributed comput-

The associated economic issues hint at the need for appro-The second part of the book (Underlying Concepts) analyses the distributable elements of a tion and equipment selection.
In this brief final chapter, the

author emphasises the point that many complex decisions must be made before it is possible to make a realictic assessment of a specific distributed ayslems arch-

The book is well organised nod and allocation ore considered and the five chapters constituting this section introduce several inreadable and should benefit managers and system designers proach to distributed econputing. PHILIP BARKER

Too little,

Microprocessors in Manufac-

tured Products, by Jim Northcott, John Maril and An-thony Zellinger, £3.25; Report No.590 (Nov 1980) of the Policy Studies Institute

I HII joint authors of this report
ltave interviewed senior personnel
of 90 British companies operating

in five different sectors of indus-

Despite all this work, the unly conclusion they reach which is not already well known, is that many domestic firms would like stan-

THERE has been a plethe books on the standard lang and it is often difficult to n stand why publishers bring new titles with such regu-when they often offer little

Useful

addition

Algol-ali

House, Cooper Street, Cli-ter PO19 IEB.

vious that any reviewer mus-closely to find specific reason any new publication shoo recommended in place of addition to the texts alrea

Coherent

At £12, there will have a paperback version before of risualise students purchasin mended on several grounds. Drawing on their teachi perience, Brailstord and present the topics in a co examples and exercises.

book and the autijors close they all work, having been on both an ICL 1906A and n the Cyber 175 at the Uni

The typeface is clear as sample output provided fro worked examples even me examples appearing in many language texts publ

Versatility

chapters covering basic feat the language there is a cha

caso studica comprising five tested programs which are a plays clock patience, the se

programt to solve algebrain tiona by Newton's ile

map.
These provide a useful ment to the earlier chapters example on wages is perfunfortunate choice.
Brallsford and Walker

out that we have over sit PAYE tax calculations," ! tinue by justifying the pro demonstrating Algol's for facilities in producing pri

While not disputing to rithm they used to compute authors should be taken to producing a program wit not earry out data validat does not contain control to

The final chapter is a m containing advanced fee both Algol 68 and Algol 60 Despite extended crit the case study on wages, I

addition to any library at of a new series; Compt their Applications.

All the publications duced to a high editorial but the hardback price

the book to be more co

cribed booklists."

so, you will have first-hand

experience of the problems involved, and you must have wished for a standard interconnection method. Standards for Open Systems interconnection (OSI) are being

prepared to help solve this sort of problem. It is described here by KIRK GEE, a senior consultant with the **National Computing Centre's** distributed computing div.

Solving the problem of system communication

THE purpose of OSI is for any terlinking processors at an oil reone user for his computer, program or terminal) to be able to communicate with any other. occess, from a single device. deally each sender should not systems belonging to a number o need to know the technical charac-other organisations, provided of teristics of any recipient, except course that he has their permisthat he observes the conventious necessary to make him an "open

Syalem A

Physical connection

Figure 2. The ISO seven-layer reference model, and its relationship to X25.

A system is open if it reenguises and accepts the standardisation procedures for information exhange. An apen computer system is not umler any compulsion to receive everything that is sent to it it is not like the postal service in this respect. The openiess refers only to the potential of the system to communicate with others, to receive data and understand it.

This potential can only he exercised if both parties agree.

OSI will allow users to link together computers, terminals and other computing-related devices that they can co-operate to perform a single tusk. The task may be as simple as using o terminal to interrogate or update a file, or it may be as complex as ip-

Layers

application

Presentellon

sesalon'

tranaport

network

phyaical

link

OSI will also allow a user to sion. This has previously been fessible only where the organisations invulved have agreed to use the same connection oud access

Opportunities

But OSI will provide new uppurtunities. I'm example, imagine a group of separate companies, coch running its uwn DP system. To exchange information atored in these systems it may be necessary interconnect them. This can only be possible if standards for unnection, OSI standards are observed by all the partici-

from different manufacturers su eased if standards for OSI could be Many other situations would be agreed soon. If all computer systems presented to the outside world a standard image with com-mon communications interfaces, it would be possible for any compu-

X 25 Lavel 3

X 25 Level 2

X 25 Level 1

sny other ond exchange meaning-ful information.

This can be an existing system, such as the public telephone net-

moai important point deserving

Being able to interconnect computing systems and exchange bit strings is not enough; the recipient must also be able to understand the messages being sent to him. Thus we also need conventions which all users of an open network must observe to ensure that the nessages are exchanged in a standard manner, and can be interpreted and understood when re-

These conventions are called data . communication protocols; by standardising them, open interworking will be made possible.

We usually divide the functions necessary for OSI into those which those which ore processingoriented, as showe in Figure 1 boundary between the two types is knuwn as the transport service interface. Let us now look at what we need

To start with, a uacr occds

System B

Physical connection

level protocols which must be independent of the actual transmis on mecbanism being used.
To structure the standards work we also need a model which divides uo the problem ioto manageable portioos, so a layered ap-proach has been adopted with clearly defined interfaces between idjacent layers and separable fuoc-

with their use.

tioos for each layer. The ISO subcommittee on open ms interconnectioo has pro-

duced a seven-layer model.

The physical layer is concerned with the physical and electrical connections to the data commuoications network, which is the physical medium for interconnec-

The data link layer provides techniques to ensure that error-free data may be transmitted using error-prone physical circuits.
The network layer provides the

switching and routeing functions for the data to be exchanged be-

The next, the transport layer, insulates the processing functions

port service work or a privote network, or it

can be a purpose-built data trans-

widespread development of

national and international

switched data networks which

make possible tha interconnection

Thus we have, or will soon gct,

Model

Responsibility for standardising

We are currently witnessing the

The next layer is the session layer which handles the logical connections between co-operating oceases or users in the two end

cerned with "presenting" the data to the highest layer in the correct form for the applications to under-The application layer is con-

of different computers and terminals. The telecommunications cerned with functions which authorities are responsible for directly serve the ultimate users of these, and wurking through The ISO reference model for CCITT, their representative body, they have set standards concerned opeo systems interconnectioo was

aced to provide a common sis for the co-ordination of stanstandards for interconnection of computers, ie the communicationarea, and to allow existing stanoriented functions and low-level dards to be placed in the ovarall

It is not intended to define the services and protocols in aufficient detail for it to serve as a apecifica-

processing-oriented functions rests with ISO. These standards are It is meant to be flexible enough concerned with the so-called highto accommodate changes in technology and in the applications for which it will be used, as well as allowing for a gradual change from existing systems to a full implementation of open systema inerconnection atandards.

In fact the reference model, in its final status, will be o framework which will define precisely and unambiguously the behaviour of an open system.

Problems .

But the model will serve other purposes depending on the in-terests of those wishing to use it. Already some telecommunications authoritles plan to use it for the eletex or videotex services, while some computer manufacturers continue to develop their network architectures, in compliance with the reference model as far as the current definition of it allows. This reflects the fact that the model covers a wide range of topics io both

Problems obviously exist in adapting existing architectures to the reference model, especially in the upper layers. Indeed, the presentatioo services, for virtual terminals or remote job entry for Instance, have been studied and mplemented by some computer naoulacturers in advance of the work oo open systems intercoonection, so these may have to be adapted in order to fil. into the

model's framework.

The three lowest layers of the model relate closely to the physical properties of services offered by the telecomment authorities (PTTs)

the telecomms authorities (PTTs).

The lowest layer, the physical layer, specifies the physical properties at the interface with the transmission medium. The V24 in-terchange: circuit definition used for an analogue point lo-point cir-cuit is implemented in the physical

Packet switching networks may require the use of the CCITT X25 recommandation. Its relationship to the OSI reference model is shown in Florita?

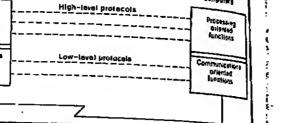
showo in Figure 2.

At the higher levels of the reference model, there are certain services which are common to most.

vices which are common to most user systems and which can be sensibly standardised. These are:

The virtual terminal service which eliminates most incompatibilities between applications and terminate thin them.

The virtual file service which overpones the differences in file structures found in a distributed system made of distimitar compulers so that files can be transferred.



from the characteristics of the dato accessed and msnipulated from a communications network actually remote location. · The job transfer and manion lation service which sllows jobs to tions-oriented functions and are be entered and manipulated on collectively known as the transvarious host computers from n-

> Between the high-level and lowlevel services is the transport ser-vice which will isolate the processing-oriented fuoctions from the haracteristics of the data octwork and provide the facilities for a najversal data transmission mechanism. This is currently receiving a

good deal of publicity, with seven proposals under consider-All organisations which pe computers will be influenced by open systems interconnection stem-Computer manufacturers and software and petipheral

suppliers will also be affected, possibly very aignificantly. Those who stand to gain most from a standard open systems interconnection architecture are us ers. They will be free to choose computers, terminals, disco and printers from all the suppliers who observe the standards, in the knowledge that they will be com-

They will be able to choose the computer which is most suitable their particular task, rather than be constrained by the equip-ment available from their man

The availability of such a standard architecture is expected t ossist the development of distri buted systems - not necessarily open networks in the wide sens used in the reference model, bu systems built more easily and

Distributed systems, if designed and managed properly, cao bid benefits to their users as well a encouraging more applications as

But In spite of these prospects suppliers of computing equipment and services today have a difficult decision to make if they plan to provide diatributed systems. ither they can design an overa plan, together with sets of rules, to which all their related products conform - their own network architecture - or they can walt for universally agreed techniques to become available.

Benefit

If they choose to provide their owo design for a distributed aystem architecture it is unlikely to be compatible with all the others on the market, or with the one finally agreed as a standard. Behas very many committed customers he could lose orders from orga-nisations which already use other makes of computer.

If they decide to wait for a uni-vorsally agreed standard distributed system architecture, then it the interim they run the risk of losing those customers who want a proprietary system now. However, a standard architecture

ture or reference model will be al great benefit to all suppliers. They will have a definite framework which they can follow and the knowledge that if most of them observe the standards they will not boy to the standards they will not be standard hove to waste valuable effort in constructing special hardware of software for interfacing to equip. ment of another supplier.

This has been an introduction to the ideas behind the OSI work. The detailed definitions are contained almost entirely in working tained almost entirely in working papers, written by experts for the perts working in the area. To bridge the gap NCC has published a guide onnuled Am Introduction to Open. Systems: Inter-connection parts of which were used in writing this article.

PRODUCT NEWS INTERNATIONAL

as a coherent system. The result-

formation to be passed freely to all

processes in all execution modes

The systems will be delivered

around, fur example, a DPS 68M

processor of 4 megobytes, with 2,500 megabytes online storage, is

ing standardisation

CII-HB markets the Multics system

system, Multics, is available from encooraging communication hetween users, flexible control lan-

The hardware and operating guage which esn he formed into system are designed to ensure high levels of security. The DPS 68M programs, and software designed and DPS 8/7OM computers used for Multies (Multiplexed Information and Computing Service) include from one to six central (all inter-language calls are processors; and each system modle can be duplicated to provide a from the second quarter of 1981. The sale price of an entry-level

Main characteristics of the system's hardware are: One level Multics configuration, built virtual memory which is extended to files; all generoted code is reentrant; dynamic linking; eight rings of protection level which control the rights of each process in the system and guarantee doto protection; control by hardwara of access rights and multiprocessor hardware enabling each processor to execute any task (system or

The aystem is intended primarily to provide a range of services to processing and the communication of informatioo. Software features

CII-Honeywell Bull (CW), 94, and manual text entry, twin Avenue Gambetta 75020, Paria.

Dumb terminal launch

Designated the ADM-5 Dumb gramme mode key designed for TerminsI, the VDU provides users use as a programming aid to write sity, limited editing eapability and a gated extension port for selected transmission to any serial RS 232C

It has a full 12 inch anti-reflec-

Low-cost **VDU** range extended

BURNT Hill Blectronics has extended its range of 19 inch rack-mounting visual display units with the intelligent BH 913 and BH 921

Main advantages claimed for the terminals, which feature one and two page memory respectively, are those of low cost, ease of maintenance and industry compatibility.

Features of both units loclude a 12io CRT displaylog 24 lines of 80 upper or lower case characters on a

× 10 dot matrix with 12 × 10 esolution, dual intensity display

being selectable.
Additional features of the twopage memory BH 921 include 80
storable tab positions and a prioter port for hard copy.

Associated remote keyboards

the BH 914 for the BH 913 and the BH 922 for the BH 921, the BH 914 featuring 82 keys including a 14-key numeric keypad.

Burnt Hill Electronics (CW), Holder Road, Aldershot, Hants GUI248H

Cable faults

A RANGE of diagnostic devices, available from Thames Electronics, are designed to identify faults in data communications environ-

serting the transmitter at one end aerting the transmitter at one end yis the D type connector, a sequential positive voltage is passed over each wife in the cable. This voltage is detected by the receiver and displayed on an LED array office lines has been given to Inhumbered 1.25; it will show the end of the content of the

The DPS 8/7OM is shout 1.7 times more powerful than the DPS 68M. The sale price of a configura-tion built around a DPS 8/7OM processur of 6 megabytes, with 3000 megabytes of online storage is about £780,000. Munthly rentol of Multics basic software costs about £33,000.

A DUMB Termioal video display with visual attributes and limited editing is available from Lesr Siegler Data Products. Designated the ADM 5 Dumb keypad, teo switch selectable baud ratea (75 to 19200), and a pro-

into display memory.

The ADM-5 displays oil the control codes in addition to the 96 ASCII character set.

Lear Siegler, Orchard House Connaught Road, Brookwood Surrey, Tel: (048 67) 80666.

Broad-band FET series

A SERIES of VMOS power FETa for broad-band applications in high frequency amplifiers is availoble from Semiconducto

Specialists (UK).
Called the Silconix DV-2840,
-2880 and -28120, they are designed for applications in HF,
VHF and UHF omplifiers in class A, B or C operation, and are capable of delivering 40, 80 and 120 Watta respectively. Each delivers the rated output at 28. Volts and provides a minimum power gain of 10dB at 175 MHz.

Prices start at £25 in quantitie of one to 29.

Semiconductor Specialists (CW), Carrol House, 159 High Stroet, Ylewaloy, West Draytoo, Middlesex. Tel.: (08954) 45522.

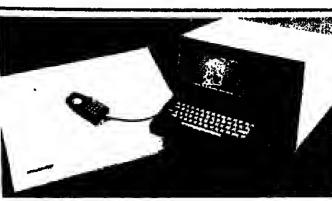
Oscilloscope

TEN to 15 Mhz dual trace oscilloscope la available from Sco-pex Instrumeo ta. Called the 14D10, it replaces the company's
4D10B model. The instrument is controlled by a potentiometer and ± pushbutton switch, which trig ger positive and negative edges of digital pulse trains, without re-ad-

The timebase ranges from 100 microsec/cm to 1 microsec/cm. Add and lovert facilities are pro-

It costs £230 + VAT ments.

The range includes a multiway rial Eatate, Pixmore Avenue, table tester, developed to test Letchworth, SG6 1]]. Tel: 04626 V24/RS232 cables in situ. By in-



Graphics digitiser station

IGD (Intersctive Graphics Digitiser), is a processor-driven digitiser station available from GTCO

tion includes digitiser, graphical display, keyboard, floppy-storage and complete terminal suftware. It can be applied to textile design, inedical research, survey analysis, urban planning, scismic

data processing and mapping.

It has a high resolution large format input digitising hoard, test and graphics VDU, 128 character ASC11 keyboard for command

high speed slata storage and twin Hoppy disc drives affording a further 320K-hytes of mass data lts I/O parts enoble a variety of

other peripherals and communico-tions media to be connected. The software caters for both data management and creative interactive

While the interactive design putines are controlled by in-huilt computer, supervision of data storage is controlled by a second dedi-GTCO Europe, (CW) 75, iodsor Avenue, Hillingdon

Middx. Tel:(0895) 39812.

computer terminal cotalogue. Improvements have been made in forms handling capabilities and the new model is a lightweight 30 chps teleprinter designed for the office environment. Its 9 x 7 inat-

Designed to cut down noise from printers

from Power Equipment is de- ration of printer operation. A signed to reduce the noise of a small fair is also fined in the casing to circulate air and keep the prif wide range of popular data and word processing printers. Known ter cool. Full facilities are buil into every Silencer to accomin as Silencers, the enclosures consist date both rear and hase paper feed inlers and outlets.

A heavy gauge steel tray fits beneath the primer. This is fined with dense abrasion-resistant foam which absorbs vibration and noise. The main cosing is sheet steel fab-rication finished in Mist Grey or-

The entire top and front sections the enclusives are nne-piece transparent acrylic sheets which lift up on gas-filled strais for

Rair enhances Decwriter

THE enhanced Decwriter IV LA34-AA has been added to Rair's

rix print head prints the full upper and lower case ASCII character set

for the series, which is sintable for use with about 60 different undeld receive only printers including machines from Anadex, Datasaaly Diahlo, Facit, Hewlett Packard Mannesmann, Mael, Qome and Power Equipment (CW)

I'm to 75% reduction is claime

Kingsbury Rnad, London, NW9 8UU. Tel: 01-205 0033.

on single slicer, rull or tractor feed band via cither an EIA RS232Cor

20mA current bon interface. Its feature is the ability to prim It custs £625 Rair (CW), 30-32 Neal Street,

Lundon WC2H 9PS. Tel: 01-836

CENTRE INTERNATIONAL ROGIER, BRUSSELS MAY 5-7, 1981

IS an important specialist exhibition for all who are interested in small computers, peripherals, terminals and microcomputers. It is ideally suited to those who are looking for immediate, low-cost solutions to their computing problems.

Sponsored by the leading publications "Computer Weekly", "Systems International", "Data Processing" and "Practical Computing" in association with the leading Dutch publication "Computable", Compec Europe has now established itself

EUROPE'S LEADING SHOWPIECE FOR COMPUTERS, PERIPHERALS AND SOFTWARE

Intrance to the exhibition is by registration on a ticket which is *FREE if obtained in advance or 220 BFr if obtained at the door.

> For your *FREE advance tickets write to:-Compec Europe Tickets
> IPC Exhibitions Ltd Surrey House 1 Throwley Way Sutton Surrey SM1 4QQ

*Please note applications received after April 6 cannot be accepted:

Satellite communications and you... Practical Computing Practical Computing The February Issue, available from leading newsagents, examines the feasibility of exchanging data between home computers, using satallities; in principle a small robiton dish parial would show a home computer in the UK to communicate with other users in the USA and Europe, Just think what that could do to your telephone bills. Also in this issue: And its the software side a seeiew of OZZ — a powerful information handling system which can be implemented on a Pel. In the application area we see how a tirm of stokemators in making use of a ridero. In this application area we see how a tirm of stokemators in making use of a ridero technology coming to the aid of an idia call. All this plus put regular advice commis, locusests of Pet Apple and Tandy sucress of only 600. From puts newspapents or post this toupon new. Out January 21.

DEC SYSTEMS FAST!

Limited • YORK HOUSE, STEVENAGE ROAD

- HITCHIN, HERTFORDSHIRE, SG4 9DY
- PDP_® BASED COMPUTER SYSTEMS.
- FULL RANGE OF SOFTWARE
- PER CALL OR CONTRACT MAINTENANCE AVAILABLE
- WIDE RANGE OF DEC® COMPATIBLES
- TELEPHONE:0462 31116 TELEX:825647

systems and

★ PDP11/03 ⓑ /TO VAX 11/780 ஞ

COMPATIBLES **APPLICATION**

orth Finchley, London N12 OAZ Tel: 01-349 2911 Telex: 28227

nel Mux LTE18-NRZ/PE 48IPS Meg. Tepe end Controller LAMBART COMPUTING, B2 Moorbridge Road, Meldenhaad, Barks 815 880 Tel: 0628 72037. Telex: 848635 "Regletered Trade Merk of Olgital Equipment Co. Limited

BM 129,029 PRINTING CARD PUNCHES

SORTER - REPRODUCERS - INTERPRETERS * EX STOCK *NEW/FULLY REFURBISHED *FULL WARRANTY *VARIOUS CODE OPTIONS CDL COMMERCIAL DATA LTD. TEL. BASILDON (0268) 710292

BUY SELL TRADE DEC PDP11

For new/used Proceasors, Peripherals, Modules or complete systems SPECIAL OFFER for limited period EX-STOCK 11/34 128 KB in csb, LA36 with dusi RK05Js from £9,800 with dusi RK08s from £14,900

Call Peter Stock or Peter Hufton 0802-861774
Destrade Ltd., 11 Musters Road, Wast Bridgford, Nottingham
Telex 377678 VIDEUR

AIR FILTERS & MAGNETIC HEADS

Computers Bought and

DEC

LPL11-600LPM Bend Printer In

Controller
RMD3-Add-on Drive
RL02-10M8 Disc
M8780-VAX Memory
LA120-Printer Terminal
VT100 V.D.U.

EOB LIMITED

Tel: 0783-44777 Telex: 537763

MAGNETIC TAPE TRANSLATIONS & CONVERSIONS ICKS COMPUTER SERVICES LI prihomo Road, Faltridge Cast (stead, Sussex Tolephone 0342 21211

> FOR SALE - ISM 370/148 JOO IBM 3830 Disk Controller

For further details contact:
Mr. G. Freeman
on Chesterfield (0246) 77241
Ext, 2328

Magnetic Heads and Air Filters available on etock for the following Disk Drives: CDC, AMPEX, DATA GENERAL, DRI, DIABLO, CALCOMP, IBM, PERTEC, WANGCO, MEMOREX, IOMEC, ISS, BASF, ETC. VAS COMPUTER PARTS AND ACCESSORIES LIMITED, TOWER HOUSE, COLLEGE ROAD, BROMLEY. KENT, ENGLAND. TELEPHONE: 01-464 5695. Telex: 896559 CALL US FOR FURTHER INFORMATION AND BROCHURES

BDS Computer (UK) Ltd.

To mark the opening of their new UK office BDS Computer Corp has

Dataproducts

M200 340cps matrix printers with any interface, 6/8 lpi, forms length select switch, diagnostic display, self test, pedestal and shelf, condensed and expanded print.

Available whilst stocks last at the UNREPEATABLE price £995

For further information contact:

BDS Computer (UK) Ltd., 58 Kings Road, Reading, Berkshire RG1 3AA Telephone: 0734 596386/7 Telex No. 847423 COC RG

Also available the complete range of Dataproducts and Data Printer with interface and controllers for almost



Advertising Rates
PHONE: 01-661 3500 ext. 3571

WANTED IBM, ICL COMPUTERS

We specialise in buying and de-commissioning computer squip-

Raybold Computer Bervices Unit 12 West Station Industrial Estate Spital Road, Maldon, Essex Tel: Meldon (0621) 54889

VT 100 VDU's Ex-Stock £950 aach

e have VT100-AB VDU's availebl immediate detrety. These units are new, unopened, and carry a 30 day return to lectory warranty The price includes delivery to England. Scotland and Wales

Base contect: Mr. M. J. Allum Oate Oevelopment Systems Ltd Newbury Telephone: 0836 48773

FOR SALE

We have the capacity to punch you so column cards.

BRAND NEW

All the above at £1,800 each one

Apply: Mr. Bromley ational Stock Distr

Birmingham 14 Tel: 021-443 3232

Conlect: Jill Curry — Ashford (Middx.) 87141 or Marie Oukony 01 864 9298

2 OLIVETTI OCO 2005 OLIVETTI A5 OLIVETTI TES401

But werehouse solled machines consisting of:

1 OLIVETTI A4 at £900 ono

J.M. DATA

Dete General 8503 Nove 3-NEW DEC/

12 two diec drives, printer, 3 VDUs, etc., evallable im

Tel: 0633 214126

D.P. CONSULTANTS

LTD. 01-449 3B12 01-441 0793

USED DEC

etic Stripe Carde plus Casa

Berdon Hil) Quarries Ltd 0530 96226 ext 29

FOR SALE

TWO SURROUGHS 18541 COMPUTERS

WD(P)

(W)D(P)

01-464 9011

TALEX 398888

WESSTER S/P SERVICES LTS. 45 WOODER ROLD, BROWLEY

PDP-11/40 **FOR SALE**

WEBSTER D/P SERVICES LTD.

NEW/USED COMPUTER EQUIPMENT BUY OR SELL THROUGH

NEW DE LUXE 80 COLUMN

HAND PUNCHES (EX-STOCK)

-256 KB memory

RP04 88 M-Byte Disk Drive + Controller

-6 x DL11-E's

-RSTS/E Software Licence (Category A) £20,000

Tel. 0784 37411

BARGAIN

Two Data General Micro Novas, 10 Megabyte and 12½ Megebyte Discs each with one VDU end one Printar and Sales, Purchase and Nominal Ledgers. £14,950 each. Immediate delivery.

Telephone: 0420 \$3550

Telex: 858861

SCHH-YOU KNOW WHO

Silent 700, 743, 733 & 745 owners take note

SHEFFORD ELECTRONICS LTD

will be glad to quote for terminal maintenance and

we'll rectore their health Tel: Stevenage 62978/Hitchin 811763

EUROPEAN INVESTMENT BANK

To sell

- IBM 370-125 Model, 2 - 256 K (IBM) + 512 K (INTEL)
- + 3411 Model. 3

available now

BANQUE EUROPEENNE D'INVESTISSEMENT Plateau du Kirchberg

100; Bld Konrad-Adenauer LUXEMBOURG - tel. 4379.6028

DEC and DATA GENERAL

Buy, Sell or Trade Call Alastair Dods 01-464 0942 Thomas Business Systems, Ltd.

SURPLUS HARDWARE

SUPERLATIVE USED COMPUTER **EQUIPMENT-AS NEW CONDITION**

DEC DISKS

RIO1 AK 5 Meg. add-on dask drive £1955.00 RXO5 14 Meg. add-on dask drive lasm £3254.00 RXO7 ED 28 Meg. add-on dask drive P.O.A.

DEC OPTIONS - PDP11 SERIES

DEC OPTIONS - PDP8 SERIES

ODITA 4-slet system und ODITB 4-slet system and OLIT Serial Weifage OLITWA/B Serial Interface/Line Clock

DEC PROCESSORS

PGP 11/03-SO Processor is 3% is Charset complete with 16 kW MQS Memory and ELS option NEW £1495.00 PDP 11/04 Processor in 10 bin Chassis complete with 15KW MOS Memory and DL I IW Interface (can be enhanced to 25KW) KEW E4500,00

PDP 11/34 Processor (non-A) in 10¹/₂in Classes complete with 120KB MOS Memory, DL1 IV Interface and Programmers Front Panel £5500.00

DEC TERMINALS

LA 34 DECymter IV with R8232 Interface and Tractor Feed Option £495.00 LA 36 DECentiler JI with R\$232 leterlace E750.00 VT 82 DECecope with RS232 totaliace 2450,00 YT SS DECocope graphics transmed with integral
YT SS DECocope graphics transmed with integral
C1900.00



ALL EQUIPMENT RECONDING KED UNILESS OTHERWISE STATED

Electronic Brokers Ltd., 61/85 Kings Cross Road,
Landon WCIX 9LN, Tel: 01-278 3461, Telés: 298894.

ELECTRONIC BROKERS LTD

01-439 6481

TEMPORARY STAFF — Elfectis Gravia providsa staif et ell

● HOLIDAY COVER ● COVER DURING SICKNESS

 PHASING OUT OLD HARDWARE SITE RELOCATION
 INTRODUCING NEW HARDWARE PEAK LOAD COVER.
OPERATORS, TECHNICAL SUPPORT, DATA PREPARATION STAFF. JCL/MACRO WRITERS, SYSTEMS DEVELOPMENT, MANAGEMENT FACILITIES MANAGEMENT.

PERMANENT STAFF -- Our permonent recru

DATA PREPARATION . MANAGEMENT . OPERATORS TECHNICAL SUPPORT . DATA CONTROL . PROGRAMMER SYSTEM-ANALYSTS
 TRAINEES.
 RECRUITMENT AOVERTISING: COPYWRITING, FILE SEARCH

Top professionals in an established company



COMPUTER PERSONNEL CONBULTANTS. National House, 66 Wardour Street, London W1V 3HP. Tel 01-439 8481, 24 Hour Answering Service. Lic. No. SE(A) 62

FOR SALE

Moleculer 18 24K Byle CPU
2 - DRI Series 30 Disk Drives
1 - A/N Displey Keyboerd
CDC300 beud VDU, 200 LPM LI

Cen be seen at Wembley, Middx An ideal system for a manufact or distribution company.

Engineering ntensive course of lectures 6-10 April 1981 BRUNEL UNIVERBITY

PASCAL A Deeign Tool for

microcomputer

Systems

Phone: UXBRIDGE 37188 ext. 700 701/2 for Course Brochure

1981 **FEATURES PROGRAMME**

19 February Software

5 March

Microsystems Preview

26 March

Peripherals

16 April

Communications

Contact: David Hogan on 01-661 3500

One step further towards design

technique of occess path anolysis was described os a method of charing an elementary function's use of the entity types, attribute types and relationship types.

This article is concerned with entity life cycles, which use the information collected during access path analysia shout the elementary functions' use of entity types, to go one step further towards system and program design and transaction design

In order to understand why the concept of entity life cycles was developed, it is worth considering what a "system" is. The behaviour of a husiness system could be looked on as the co-ordinated total of the beliaviour of all entities in the husiness.

In other words, the system consists of the entities inter-reacting with each other. The hehaviour of the entities in the system is an organised reaction to the events affecting those entities; each entity is reacting to the events in which it

Entity life cycles are a pictorial method of analysing the behaviour of entities by considering each entity type and all the eventa which may affect an entity of that type during its "life" (its existence as because which its existence as known within the system).
Since the eventa in which we are

Interested are the events which trigger action in the system, the events which are used are those which initiate elementary functions. Thus when an event affects an entity, it is because an elementary function is executed as a re-

In our hospital example the event "Person Dles" triggered the elementary function "Record Patient Death".

Entity life cycles have several 3. Check that all Attribute types

functions have been covered. The limitation of the entity model is that it can provide only a static picture of the system. Entity life cycles have all the advantages of the entity model — i.e. being a picture they help to aummarise the facts in a neat compact way - but in addition show the dynomics of the system from a different view-

point, that of the entity. Because the viewpoint is dirferent, entity life cycles provide a method which cnables the analyst to cross check that all the events and hence elementary functions have been covered.

Provide validation tehles for in program and system de-

Entity life cycles use a concept called the "state" of an entity. A "state" is the condition of an entity or mode of existence as determine by events (this will he explained more fully later).

Example: The event "Marriage" would place a person in a "Mar-"Death" would place him in a "Dead" state.

"Death" would place him in a "Dead" state.

Entity life cycles can be used to determine the validity of transactions

This means that both the valid "states" of an entity and the valid events for those valid states, are

For example, it would be invalid to attempt to "Set up an Appointment for a Patient" if the patient

was in the "Dead" state.

Butty life cycles thus provide a besla for transaction control

TDS offer the ADDS Regent 20

foraslittle as...

The atate of an entity is determined by events. "State" is snother word for entity sub-types which are event-dependent. There were two types of entity sub-types those which were event-de-pendent and those which were not.

Entity stib-types were identified by means of attribute types and states are represented in the same way, e.g. the married state is represented by the attribute type "Marital Status" with values "Married" ot "Not Married". The state "Dead" may be identifiable by the attribute type "Date of Death".

Thus entity life cycles help establish further attribute types.

4. Programs can he written

eround entity typea. The traditional approach to systems design has been to write horizontal programs or programs for each transaction type, where these "programs" may become modules or subroutines in some larger master file update

An alternative opproach is that vertical programs - consisting of a program or module (or set di programs or modules) for each enity type whose structure is based on the elementary functions which effect the entity type.

The program is capable of processing each transaction indeidently of earlier transactions by storing all earlier transaction data by means of ettribute types lesignating each entity state.

This approach has several very distinct edvantages over the tradiional methods:

programs, which determine the valid sequence of transactions for en-It becomes easier to amend the system. A new elementary function can be analysed, new sttitles in certain states.

tribute types created and new modules added to the life cycle programa without excessive effort and with minimal effect on the other modules or programs in the

of functional decomposition - as the analysis of each event and its sccess path through the model can be the basis for "transaction programs' which call each

through the life cycle programa.

life cycles.

n Part 18.

merit further study.

ii. The programs are implementable directly using the results

programs might work. Note that the process has been simplified to

Transactions are entered into a basic data vet program which pro-vides simple validation of the data n each transaction, using a data

into a transaction scheduler which schedules the transactions and passes them to programs which manage each individual type of

programs or modules as required. validating the transaction against the state of the entities in the database and then executing it Basic steps in drawing entity

There are five basic steps to drawing entity life cycles. The first

by Rosemary Rock-Evans

program or module.

Figure | shows diagrammatically the principle of how life cycle

show the basic idea.

The validated data is entered

These transaction type managers then call the entity life cycle.

2. Decide which entity types merit further etudy. It is not worth drawing entity life cyclea for entity types which have no state changes during their

5. Draw the entity life cycle

use of the entity types.

Information from the Access Path

draw e grid of elementary func-

tions against entity types. An

Summerise the functions'

two steps will be covered here, the lives (other than the "Created" Deleted" and "Archived" Hain next two in Part 17 and the last Thus, entity life cycles should only be drawn for entity types which

use of the entity types.

2. Decide which entity types a. Involved in many elementary functions.

Fundamental to the enti-3. Determine the velid "states" of the entity type.
4. Draw entity life cycle diaprise, i.e. of primary important to its business activities. grams for the entity types chosen.

of our series describing e

system design methodology

Summery. The concept of a-tiry life cycles has been introduced and the purposes of entity life sycles explained, i.e.; checking the all the events and functions have been covered; providing validafor a Function Forms is used to tion rules for use in system and ; program design; checking that to ettribute types have been missed and program design based on a

example is shown in Figure 2 for our hospital model. (Only a small number of functions have been considered, for simplicity's sake.) tity life cycles.
In Part 17 the two concepts of "state" and entity life cycle diwill be explained more

The Doto Analysis methoding was developed of CACI by la

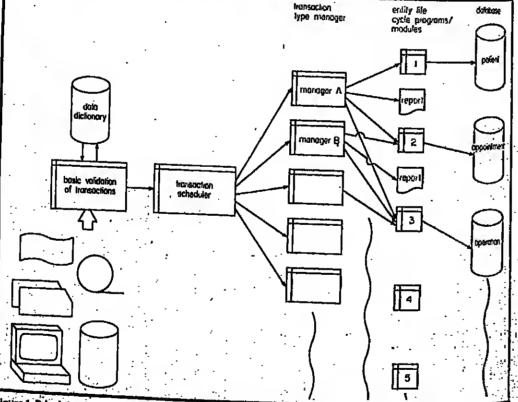


Figure 1. Principle of programs written for entitles.

	Entity type	function u	stige chart			
lementary functions	Patient	Operation	Illness	Appointment	Doctor	Nurse
lurse's inquiry (FI)	1	1	1		LOCUOI	1
ospital admillance (F2)	/					
(Chive polient (F3)	/	1.				
octor's referral of potient to Spital (F4)	/					1
ocessing potient's death (F5)	/	/	1. V			
odessing patient's birth (F6)	/	/				J.
clors inquiry (F7)		/	1	y	7	
charge of polical (FB)	/		Y	Y	V	
	1		50.30.50.91	20. 1 1. 19. 19.		(f) did

2. Entity type/forietion water chara

Appointments THE NEWSPAPER COMPUTER PEOPLE RELY ON pointments

taleaghter milite adjects, the least of and stee Weekly at the of over od treas.

Cosmidd Rates 619 per std 19 a 3 nots # 687 c 30 a 3 cts > 61 476 that Pages 19 a 7 cots = 62 55 3 a 4 cts = 61 732 Full Pages 30 a 7 cots > 62 900

top Englishment on the State of Line Flags Consultance - Line Blance from Consultance - Rendered Application of the State of Line State of the State of Line State of Line

MANCHESTER GLASGOW (Nech ker 1061 672 8661 Gelyr Awen 061 672 8861

BIRMINGNAM SRISTOL Vic Scenet (2) 1366 4833 Classified Production 01-661-3500 Ed 3104 frc -e 14-er

IMYRIADI

DIGITAL TELECOMMUNICATIONS systems development

WILTS./GLOS. BORDER

£ NEGOTIABLE

These are excellent opportunities for Programmers with real-time software development experience to move into the dynamic field of computer controlled telephony systems at the forefront of technology.

Alternetively you mey elready have exparience in telephony software development in which case this provides the opportunity to further your career by joining one of the leaders in the field.

These positions offer the following ereas, of interest:

★ Advanced digital switching technology

★ Device level softwere design

★ Telephony applications programming

* Administration end subscriber fecilities

★ CCITT signalling systems

- 3

You should offer one, or more, of the following:

* Telecommunications or process control program-

* Telephony knowledge.

★ 2-5 years' reel-time design.

* Assembler or high-level lengueges.

* Innovetive epproach to development.

These interesting positions, with e successful member of an internetional group, offer e high commencing salery entirely dependent on experience. This is supported by excellent benefits including a comprehensive relocation scheme, five weeks' holidey and opportunities for overseas trevel. Telephone the number below to discuss these vecencies in deteil. Alternatively either return the coupon or write to us quoting reference SW1/0502/CW.

MYRIAD APPOINTMENTS LIMITED

30 Fleet London EC4Y 1AA Telephone 01-353 0981 24 hours

SULTANATE OF OMAN MINISTRY OF DEFENCE **DATA PROCESSING** CONSULTANT

£16,000 - Married Status

A DP Consultant is required to carry out an initial study of the localbility of introducing DF systems into the MOD and the Services. The areas to be studied will cover all sepects of accounting including stock, payroll, purchases, each receipts and payments, parsonnal and establishment records liked asset utilisation and mointenance records and invantory

managament.

The successful candidate will recommend the policy to be adopted to effect any proposed introduction of DP and drew up an outline plan for this. He will advise on the selection of introduction of DP and drew up an outline plan for this. He will advise on the selection of hard and softwere and sealet the MOD and Service Mensigers in the development and implementation of approved DP projects.

The study is expected to take twelve months but an initial report, recommending future policy, is required within two months. The consultant will report through a joint services committee; to the Under-Secretary, MOD.

Applicants should have extensive computer systems and O and M experience, a record of successful project managament, and be familiar with DP equipment devalopment. Service experience would be an advantage but is not essential.

Employment offered on matried status, one year contract. Salary 18,000 inclusive of all banafits sod gratuity plus free ecommodation and cat. Fifty days leave, of which thirty days may be taken after five-six months, remainder on completion of contract with return all passage for leave. Similar oir passage provided at start and and of contract with return all passage for leave. Similar oir passage provided for wife and anticled children.

Astrel House, 17/19 Maddox Street, London W1R 0EY, 01 408 1010.

Astral Recruitment Associates Search, Selection, Recruitment Advertising UNIVERSITY OF SUSSEX SCHOOL OF BIOLOGICAL SCIENCES

COMPUTER **OPERATOR**

erchiving and backing-up of files, meintenance of records and logging feuts. Secretatial duties will consist motivy of typing and soldling documents and menuscripts on the computer. The computer, the computer, the computer is excellent and two PDP-11/40s. The Laboratory is an informal and irlandly community, and the post would offer an intelligent carididate the opportunity to learn more about computers, The appointment will be for approximately one statement of the programming computers. The appointment will be for approximately one in the first instance, with good prospects of renewol.

(4338

Contract Assignments Banking

Link Associates is a Software House seeking 3 Analysis and 5 Programmers to John Development Teams working for a major American Bank In London.

We can offer long, secure contracts in an interesting and welldisciplined technical environment. The installation is IBM 4341 under DOS/VS using PL/1, CICS and LIBRARIAN and the skills required are:

ANALYSTS ★ On-line Design

PROGRAMMERS ★ Minimum 2 years PL/1 **★ On-line Programming Aids**

* Technical Blas * Commercial Banking preferred * Structured Techniques

DO NOT DELAY! Contact us now to arrange early interviews for contracts starting in February, March, April and May.

Please phone: Shella Fox LINK ASSOCIATED LIMITED 24a High Street, Chesham, Bucks. (02405) 4922



ring our action deak on 0254 676921. US (Id. Philips Road, Whilehout F. Statu Blackburn, Fancs, 881 5114

The ASCOT Tektronix compatable graphics terminal £999 The Ascot terminal will give you 5/2 x 256 graphics with full Teltronix 40/01.

even better opportunity

To take advantage of these low offices:

And ... while limited stock lasts, here's an





it's the Best for the least

easy to raad 5 x 8 characters in a 24 x 80 character

format: EIA Interface: speeds up to 9600 baud. Full

auxillary output interface, print transparent capability plus monitor moda all this for only

n close oheque to the value of &___

cursor movament and addrassability



We'd like to pin ou badge on to more GoodGuys!

Entrepreneur, professional, self-starter, innovator, whatever badge you wear, make use of it by apply your career to a company that guarantees job satisfaction and progression.

We are currently rounding up all the good guys (and Gals!) especially Senior Programmers, Programmers and Analysts.

We've come a long way in 8 years - and our future is pure gold. We're on the right trail of success our current business testifies.

> Space communications and Satellite tracking systems Branded 'TOP SECRET' Complex transition conversions... Blue Chip Clients **Hotel Management** ___ Our own CHAMPS system Distributive processing. On-line development projects

Systems design, real-time projects, feasibility studies, hardware/software evaluation – all successive undertaken by our posse of dedicated professionals. No wonder we have become one of the top5 independent software houses in the country. This success has led to rapid expansion and growthat to meet these demands we require further top calibre personnel-people who want to build their ambitions and have a stake in the rewards.

WANTED

Senior Programmers Programmers and Analysts Minimum 2 years experience on: either Cobol, PL/1 or DL/1 IBM 370 or 4300 IMS or CICS data base Univac 1100 ICL 2900 VME/B

REWARD

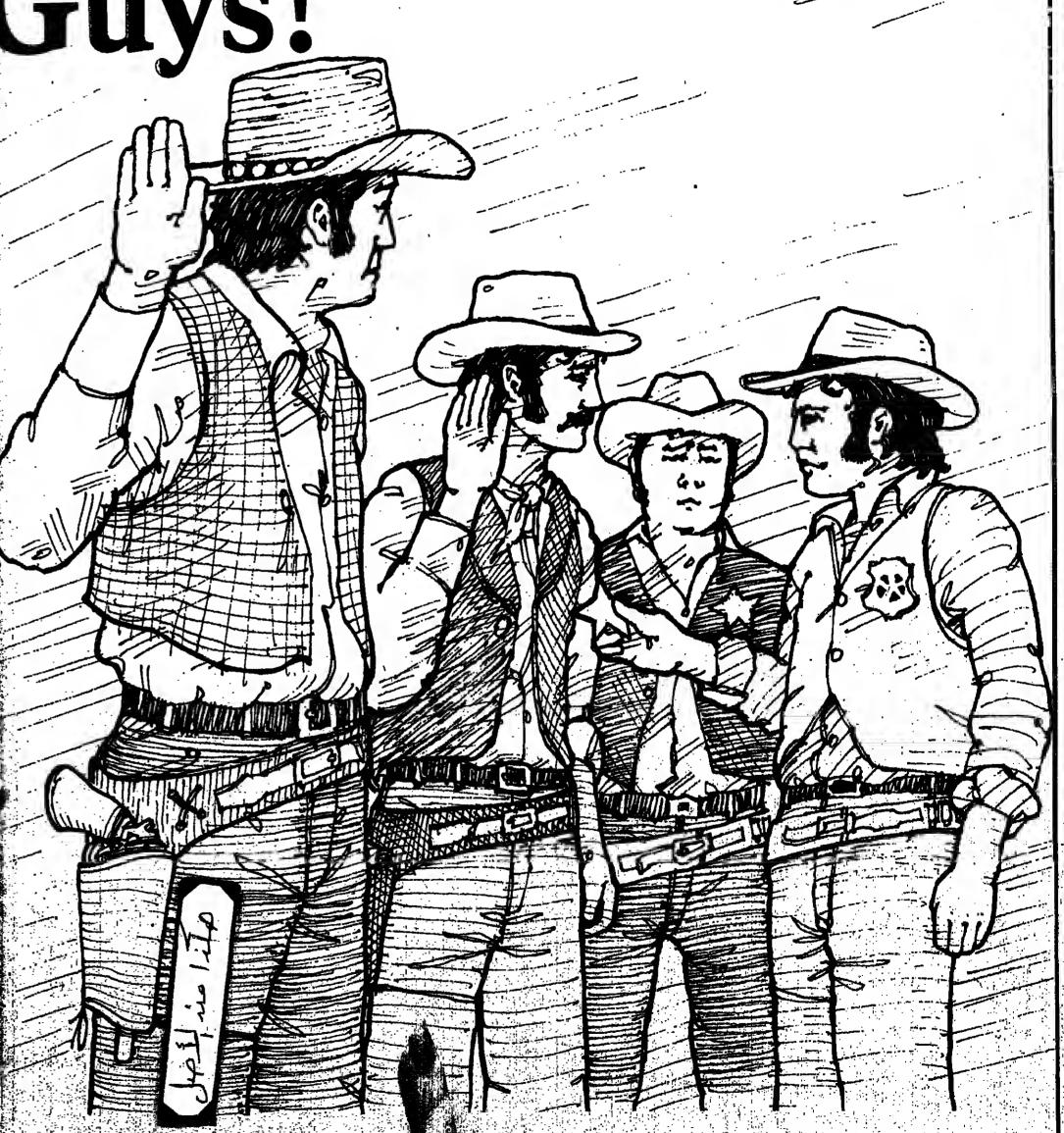
up to £12,000 **Equity Sharing** Life assurance Medical insurance **Profit participation** Career progression Job satisfaction UK or Europe

Any Voice and Data Communications Analysts should also join the Marcol posse and see why out home spun philosophy has attracted the support and loyalty of the top trail-blazers. Isn't it time for to hitch your wagon to a winner and join up with us?

Phone now or write to: Penny Bailey Marcol Computer Services Ltd 60 Queens Gardens, London W2 Tel: 01-402 9355 (24 hour service)



Communication and Information System



Mini/Micro Software

E.E.C. Pkg. to £16K

Programotors, Systems Designers and Project Leaders with in-depth experience of real-time systems are urgently required to join a number of project teams in Contioental Europe. Of particular interest will be those candidates with a strong background in developing software for Communications or Process Control systems.

expenses and assistance in obtaining accommodation among the benefits our clients provide.

Ref: L/5/A

Whilst all applicants will be expected to be fluent in Assembler, Fortran, Algol or derivative languages, particular hardware exposure is not a re-quirement. All positions offered are on a permanent basis with relocation

Jnr. Assembler & PL-1 Progs

City of London Salary to £7.5K

A renowned Financial and Investment Consortium, long established in The City, currently requires Junior Assembler and PL-1 Programmers for its recently upgraded IBM mainframe and mini-computer installation. Suitable candidates should have a minimum of one year's Assembler or PL-1 applications programming expotioos areas include Property and Portfolio Management, Debenture and Unit Trust Investment and Stocks/Shares Up-Date. In-house training and seminar courses will form an integral part of the education programmes.

Real-Time Programmers

Central London Salary to £9K

A leading Systems House, based in Central London, is seeking to employ additional Programmers to join its young, innovative software development team. Candidates should have a degree in a numerate subject and at least two years' real-time programming experience in either EOR. have a degree in a numerate subject and at least two years' real-time pro-gramming experience in either FOR-TRAN, CORAL 66 or Assembler. Knowledge of particular hardware is

the design, coding and testing of real-time software. Ref: L/5/C

Management Consultants

City and West End; Salary to £15K Our clients have an enviable reputa- will be given to graduates aged 28-34

tion as a Management Consultancy and Research Organisation. The Company is now seeking several additional Coosultants and Sanlor Consultants. All candidates are expected to have good personal communication skills, be self-confident and highly presentable. Generally, preference years with proven abilities to appreciate and identify business management and technical implementation problems. In particular, candidates with a knowledge of structured design techniques, data massesses. techniques, data management, net-working and VIEWDATA/PRES-TEL applications are eccouraged to apply. Ref: L/5/D

Process Control Programmers

Sth. London & Surrey Salary to £10K

leading supplier of Industrial and Process Control Hardware and Systems Software is seeking to recruit Applications Programmers and Support Analysts for its U.K. Headquarters. All respondents must offer at least one year's experience in either Assembler or FORTRAN as a company of the seeking to recruit and the seeking to recru Assembler or FORTRAN as a prim-ary language whilst those with expo-aure to PASCAL, BASIC or COBOL

will be favourably considered. You will play a significant role in all stages of software and systems development from product planning to installation and live running. Since travel both nationally and internationally will form a significant part of the job function, mobility is an essential criterion for these posidons.

Reft L/5/E

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063

Telex: 28800

Do you know where you are going?

The Systems Division of Wordplex Ltd. is embarking on the most advanced and exciting development project of this decade.

SALARY UP TO £11,000 plus BENEFITS

We now require programmers with the following experience:

- in low level or systems Languages, i.e. ASSEMBLER, PLZ/SYS. CORAL, PASCAL, etc.
- on Mini, Micro or Mainframe Computers.
- with detailed knowledge in any of the following areas:

COMMUNICATIONS, DATABASE, DISTRIBUTED PROCESSING, REALTIME AND INTERACTIVE PROCESSING, SYSTEMS DESIGN. LARGE MEDIA USAGE/ORGANISATION WORDPROCESSING, DATAPROCESSING



Call or write to: Robin J. Aliison WORDPLEX LTD. Systems Division Constable House St. Leonerd'a Road Windsor, Berkshire (07535) 57161

Software

Computer Aided Design, Test and Manufacture

Nottingham

to£11,000 p.a.

The job is to establish and manage a term producing design, manufacture and test software tools for application to the design of advanced custom VSLI integrated

The products. This position interfaces with development and manufacture of a wide, range of telecommunication and automated office products being introduced by the company into the comministrial market.

The person appointed will work within an environment of rapidly changing tecturology and it is likely that he or she will hold a good honotirs degree in electronic indicating and have had a number of years experience in the designand production of CAD software.

For further details or an application form please telephone Paul Newmani Personnel Markager on Nottingham (0602) 25483, extension 371 or write to him at Road; Beesson, Nottingham (0602) 2144.



PROGRAMMERS/PROGRAMMER

To £11,500 ontony here, pucks, and minds.

We would like to hear from candidates with good experience of ohe of the following languages/machines: Cobo/PL1/Pascs/8080/Assthib/ISMO Send ODS/NYS (370/134, 370/145, 3033, 4341, System 94-381/CC 2900 perics/PDP11 minia/DEC minis/NS 11/Weng 22001 VM NAYP & VS/Stitish Olivetti 2030, 3030/280 or 8080 microprocessors.

Please inhelphone Bernard innes for an initial discussion and an application forth of with in confidence giving, full permonal and parter optalls quoting referance CW 8111.

SYSTEMS ANALYSTS

Bucks, Londoh and Herts.

To £13,500

Several of our clients seek experienced analysts with some uper definition experience and a background of extracting the right information from a variety of people.

DESIGNERS/IMPLEMENTORS_

London
Our ollent, a paccessiter in the Computer Services industry, seeks syndrouses with a minimum of 3 years good real-time; on-line expersists with large maintrames — preferably ICL 2850+.

SYSTEMS DESIGNERS
Landon and Budgs,
To £15,000 plus car
Our dient, a passector in the Coroputer Services Industry, seeks
applicants with considerable superience in the design- and implementation of computer systems, in particular of on-line systems and
preferably with a knowledge of ICL 2500 series computers.

SENIOR CONSULTANTS

Libridot

Fast-growing opropagy in this Corptumer Services Industry seeks service and a part of the Corptumer applications expensed to the service opropagate applications expensed to the service opropagate and are applications according to the service operation of the service operations of particular integrities. Executive Recruitment Services

Collina House, 56 Woolton Drive Hemel Ham stead: Herts, HP2 115 Tel: Hemel Hempstead (0442) 42418



Queen Alexandra Hospital Portsmouth

DEVELOPMENT

ANALYST

SUPPORT

LECTURER

TECHNICAL

AUTHOR

PROGRAMMERS

PROGRAMMERS

PROGRAMMERS

PROGRAMMEN.

SYSTEMS **ANALYST**

for School of Nursing

A senior poet working with the Sanior Nursing Officer on e new project to supply mate plans for the continuous allocation of nurse learners to clinical experiance in the various erges of healths and comthe various areas of hospitals and continuity, block teaching and holidays within the Portsmouth District; and to provide, implement and monitor these plans to meet the aducational requirements of the General Nursing Council. Skilis ea Systems Analyst/Programmer and an interest in Date Processing esself tial. Applicants should have a sound editional background, with definite synchronic editional synch Sélary on shele £4834-£6312. Job description and application form from sonnel Officer. Closing data 16.2 1981

IMYRIAD

UNIVAC 1100 IBM 370 DISTRIBUTED MINIS

USER SYSTEMS SPECIALIST TO £11,500

WEST LONDON

To meet the Increasing demand for information services from users the Users Systems Support Group has been expanding steadily during the post two years. To continue this expansion they are now seeking an additional person who will provide consultancy and technical support.

Candidates will ideally offer over five years' varied experience of systems and programming with UNIVAC 1100 and Timesharing expertise being of particular interest. The role offers the person appointed the opportunity to broaden their computing knowledge within an axpanding environment where data processing ia recognised as essential to the company's growth.

TECHNICAL PROGRAMMER 1½ YRS. + COBOL. TO £8,000 **WEST LONDON**

An interesting opportunity exists for no enthusiastic Programmer to join a small group engaged in a wide range of systems uctivities. The successful candidate will design und develop small specialist systems to run on both mainframe and minl-computers as well as providing detailed technical

This role is most likely to suit a person with eighteen months' to two years' COBOL experience who is looking to move away from the mutine of project development into a role where his/hcr talents, interests and abilities will be given ample scope to expand and where a working knowledge of a wide range of hordware and software will be rapidly gained. A current appreciation of a secand language will be advantageous as would a Computer Science degree, although this is by no means essential.

Located in Hammersmith, London, W.6 our client is a major international enginearing and construction organisation. Career prospects are excellent and the employee benefits offered include: free life assurance, flexitime, paid overtime, interest-free season ticket loans and a company pension scheme, For further Information contact Myrisd Appointments: W.8.

JUNIOR BUSINESS **ANALYSTS**

CITY

£7,500-£9,000

A major international organisation is urgently seeking to appoint an additional two ambitious and self-motivated people following the expansion of its City office.

Applicants will be interested in business matters; kean to develop management skills in a position offering job satisfaction, high rewards and the opportunity of devaloping personality and axpartise in the Computer industry. Dealing with people, devaloping relationships and understanding client requirements will be a major aspect of the work, involving communications and computing skills.

Under 27 years of aga you should be well educated with alther programming or analysis experience gained in a commercial environment. In addition to a confident and outward going parsonality tha ability to work on your own initiative is a key requirement and the potential to grow with the company is of prime importance.

These positions offer a first-year salary in the ranga £7,500-£9,000 and substantially higher rewards will be achievable following comprehensive training during the first year of appointment. The Company offers a professional approach to computing issues resulting in a high competitive spirit and united commitment to growth.

SYSTEMS ANALYSIS IN THE CITY

£8,000 - £12,000

Our client provides a uniqua sarvice which combines modern computer technology with comprehensive investment information on all the major world stockmarkets. They operate one of the largest real-time terminal networks in Europe supplying a comprahensive and sophisticated computarised information analysis service based upon a larga IBM-compatible mainframe with TOTAL database managament system.

In order to meet a sustained growth in tha demand for their services, bur client requires additional Systems Analysis for a range of development projects to be taken from faciability to implementation and beyond. Previous experience in broking/financial applications would be an advantaga; but full training will be given in all areas. Although not essential it is likely that the auccassful candidnas will have a numerate degree and some experiance of Assembler Pro-

If you like problem solving, planty of user liaison, the opportunity to work on one's own as well as in a team (with the real prospect of eading a project) theo contact Myriad now to discuss the position in

Company benefits include a high starting salary, non-contributory pension, free life assurance, LVs and an interest-free season ticket

新加州市场 (1960年) · 1960年 (1960年) · 1960年 (1960年)

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y IAA Telephone 01 353 0981 24 hours

Talingung period to the formation of the property of the prope

£12K APPOINTMENTS

Management Consultancy

Data Processing

London based upto£16,000

Your work in a software house will have given you a taste for the challenge of advising a range of clients on technical DP problems, and leading a variety of projects to successful implementation. We offer the opportunity for a broader challenge, investigating both technical requirements and. their business justification, presenting your findings to sentor management,

To join us you must be around 30, with a 1st or 2nd class degree and a successful career record, ideally gained in a larger software house. Alter natively, you may have comparable experience from a menufacturer or large installation.

If you maich our needs, and we maich your ambilion. find out more about our work which includes DP strategy studics, systems reviews, hardware and software scicction, and project management.

Telephone Peter Williamson on 01-248 1511 during office hours or on (0474) 872793 in the evening, or write to bim enclosing a brief c.v. quoting reference 956/C on both caveloge and letter

■ 128 Queen Victoria Street, London EC4P 4JX

History of the state of the sta

You could earn £14k per annum in computing

The Northern Ireland Civil Service offere excellent opportunities to geln velueble experience within a large computer installation. There are prospects of promotion to poste and salaries of up to £14,000.

Current vecancles exist in the following grades:

1. SYSTEMS ANALYSTS: £6,950-£8,555

Applicants must have either a minimum of 5 years' relevant computing experience or at least 4 years' experience plus a degree, HNO or equivalent qualification in computer science or other eliled discipline with computing as a main subject. Candidates' experience must include a substantial period in systems design.

2. PROGRAMMER ANALYSTS: £5,790-£7,285
Applicante must have either a minimum of 3 years' relevant computing experience or at losst 2 years' experience plus a degree, HND or equivelent qualification as above.

3. PROGRAMMERS: £4,900-£6,230

Applicants must have at least one year's practical programming experience or hold a degree, HND or equivelent qualification as above. Final year attudents who expect to obtain this type of qualification in summer 1981 may also apply.

Experience of ICL 1900/2900 series computer (including PLAN COSOL GEORGE Operating Systems and Direct Access) or mini computers or the application of dedicated processes in the medical and scientific lields would be an edventage.

Grading and starting salary will be related to qualifications and experience. Systems Analysis are paid an incentive bonus of £854 per annum (within scale maximum) after 2 years' satisfactory service. Programmer Analysis are paid an incentive bonus of £710 per annum (within scale maximum) after one year's satisfactory service. The Civil Service Commissioners may decide to interview only those applicants who appear from the information evaluable to be best qualified.

The appointments offer the following benefits:

Good career prospects—the highest systems posts command salaries of up to

Good career prospects—the highest systems posts command salaries of up to £14,000 per annum.

Systems Analysts and Programmer Analysts are antitled to at least 22 days' leave per annum in addition to public holidays. Programmere are entitled to at least 20 days' leave per annum in addition to public holidays.

Non-contributory pension acheme apart from a deduction of 1½% towards providen of widow's pension in the case of maje officers.

Flexible working hours may be worked at certain locations.

Opportunities to broaden experience in a wide range of application grass.

Training and retraining as necessary.

informet enquirtes may be made by telephone to Cepartment of the Civil Service (telephone Belfast 760751, extension 2709) or Department of Health and Social Services (telephone Belfast 44377, extension 251).

Closing deta: 19th Fobruary, 1981; Jab Ref. SB 6/81/W, Tel. Ext. 258.

The posts are open to both men and women. Please write or telephone for en'application form (using the extension number indicated and quoting the job reference) to the Civil Service Commission, Rosepark House, Upper Newtownerde Road, Belfaet 873 3NR (telephone Dundonald 4865). Completed forms must be returned to errive not jeter then the closing date stated.



DIRECT LINE 01-661 0121

the newspaper computer people rely on

Chief Programmer

(Salary up to £12,500 plus substantial benefits)

required by Britain's leading property company.

Land Securities (Menagement) Limited, the leeding property company, is in the process of developing a renge of new computer systems. These will be based on a Honeywell Level 64, which has recently been installed, will utilise TDS and IDSII software and will Incorporete a network of terminals both in the Heed Office end Regionel Offices.

A Chief Progremmer is required to complete the teem responsible for menaging the development of these systems. Applications ere invited from men or woman who can

- Experience of Cobol progremming in en on-line environment.
- An ebility to contribute to the progremming methodology used by the
- Experience of meneging e teem of et leest ten progremmers.

Experience of the use of Honeywell Level 64 or 66 computers and/or a Codasyl detabase menegement system is desireble but not assentlel.

A starting selery of up to £12,600 per ennum is offered. Other benefits include a noncontributory pension scheme, en ennuel bonus, e shera participation schems end free BUPA end restaurent facilities.

Please send brief details of qualifications and experience to the following address. (Applicents to our recent edvertisement for e renge of computer eteff need not re-apply).

Management Services Manager, Lend Securitiee (Management) Limited, Landsec House, 21 New Fetter Lane, LONDON EC4P 4PY.

ITALY £17,460

PROGRAMMER/ ANALYST

TASK Information retrieval service, TASKS in the area of File Load, Reload and MeIntenence Accounting, Statistics and Special Utilities, Programming MODS, creation of new programmes and executioner of lergo job sequences. QUALIFICATIONS

ktensive recent experience on ISM 370 or 30xx Systems using Assembler and JCL.

The essignments are based in an attractive small town set in countryside 15 miles from Rome and within easy reach of Mediterranesh beaches

Duration 1a 4-8 months + 36 days' peld holiday, return; air fares peld and accommodation arranged.

Mr. Teny Jory
ABLATIVE LTD
6 Church Road, Long Ashton
Bristol 981 891U
Tel; Bristol (02727) 667895

(CHPA)

AIRCRAFT SIMULATOR SPECIALISTS

Hugh Pushmen Associates Limited require shiwars apparatus axpertenced in aircraft simulation, to join their expanding

Candidates should have 3+ years' expanence, present angine, radio and neweld systems. Franch lenguage to particular the present of the particular may be a sent of the particular may be a sen

Contact: Mike Sere of Pay Cleaver on 92013 81165 of and Old Hugh Purphmen Associates Ltd., Newfoundarid House, Depart BH15 1HJ.

CLASSIFIED COPY

All classified copy should reach our offices no later than 3:30 p.m. on the Monday preceding Thursday's

If complete artwork is supplied, 11 a.m. on a Tuesday.

Computer Professional Recruitment Consultancy

Sales Executive E. Midlands/Anolia UP TO 8K BASE, 17 % ON QUOTA + 2 LITRE CAR.

Dynamic market leader, exciting product range, Company distributed processing hardware, Growth based on

R35

R37

R38

Must be experienced commercial hardware sales. Applicent Direct manufecture experience prefarred. Communications orientated/technical support background usaful.

Saleaman North West/Manchester Office

CE61/2 K TO E8K BASE, £16K ON QUOTA + CAR First class mini equipment into first time commercial user markat piece. Realistic quote's, no top limit on eerninge.

Bureau Salesman North West £6K-£6.6K BASE, £10K-£11K ON QUOTA + CAR Commarcial/Technical systems batch and RJE

Saleaman London/NorthWest

£7.5 BASE, £18K ON QUOTA + CAR One of the most successful O. & M. Organisations world-wide. "Breed and butter" commercial systems on first class aquipment plus shop floor and word processing evallability. Good management, good support, no top limit on sarning. MANY OF THEIR SALESMEN EARN OVER £20K.

Write or phone, quoting reference, to C.P.R. Consultante Ltd., 432, Dewebury Road, Leade LS11 7DF Tel: (0632) 774040, 24 Hour Enquiry Recording.



NOW LOOK HERE!

IBM OPERATORS

London and S. Coast
We have a number of vacencies in the Srentford, Entitled, Croydon, City, Brighton and Bournemouth areas for IBM operators with a good knowledge of OS/VS1. Career prospects are up to you! CW 6/1 Simon

PROJECT LEADER

W. London

A major international chemical company requires a Project Leader with at least 5 years! DP background. The applicant will have experience of leading a project and of on-line systems design, involvement with OATABASE, CICS and DL1 are advantageous. There are the usual large-company benefits which are excellent. CW 6/2 Patricle

CONSULTANTS

£9,000 to £16,000 Now is the time to get in on the ground floor of a large government.

contract (based around ICL 2800) that will extend your experience and provide a worthwhile step in your serser development plans. As part of this internetional consultancy handling this contract you will be a provided in a major project requiring the highest standard of project. involved in a major project requiring the highest alonalism. CW 5/3 Michael

CONTRACT PROGRAMMERS/ANALYSTS

UNIVAC 1100 QCB CL/RPB UNIVAC 1100 DMS 1100 TLP EXP.
IBM STO PL1 MVS CICS:
IBM PL1 DS/VS1
ICL 2985 COBOL DME VME
HWELL 8000 IDS TDS COBOL
IBM DL/1 COBOL DOS
IBM SYST PROG. 3 MTHS.+ 3 MTHS.+ 8 MTHS.+ 3 MTHS.+ 3 MTHS.+ Phone Irane for details





01-995 3883 Prospect Placa, Landon W4 3BR

Systems Programmer

West Germany

c. £475 p.w. Don't Bent, a consultancy with offices to Germany and Switzerland, wishing recruit arexperienced MV5 Systems Frogrammer to assist with the Installation of a large IBM

maintraine. Knowledge of IMS is also required and it is expected that the will be a ti-12 Contact: Brian Postles

Consultants Aircraft Simulation

Paris

£20,000+expenses

Our Client, an internationally recognised consultancy, requires a number of experienced trefinitetaris to work on the development of major Atrefalt Stimilation systems. Candidates should have a degree or equivalent with at least it years real-time software design experience and have the confirmer that stems from Intal firmillarisation with the unique and often multi-million pound devices associated with this technology. Whilst nimani you will enjoy good oversens allowances as well as the excellent basic salary.

Cootact: Margaret Stevens

Systems Analysts

London/Bucks based

up to £13,000

Our Client, a harding systems house, currently has varanches for a number of Systems Analysis transists with the analysis and definition of large real-time applications. Applicants should invege minimum of six years in the analysis and determination of user remirements and should have been involved in at least one significant project using on-line/communications techniques. Must be willing to travel in visit remote users.

Market Research Consultant

West London/Europe

to £12,000+Car+Benefits

We have been retained by n leading morkel research organisation to remait a Senior Consultant who will be responsible for investigating and reporting on the marketing trends of the data processing adualry in Western Europe.

Candidates must have a minimum of 5 years experience in data processing and should

be familiar with IBM products.
This challenging position involves travel both throughout the U.K. and oversers

Systems Designers

£12.000+

An infernationally recognised systems house need two experienced people in work on the development of a major on-line system. In the early stages it great deal of time will be

speni abroad with generous overseus illowances. Five or more years must have been spent in the design and implementation of large ouline commercial systems also extensive knowledge of IBM mainframes. Experience must encompass at least one of the following languages: PL/I COBOL or Assembler, and IMS Contact: Janet Chilvers

Analyst/Programmer

Neg. to £11.000

An International Bank based in the City have a current need for an experienced Analyst/
Programmer to Join their existing team specialising in software and bandware support,
implementation and development for local and overseas offices.
Applicants will have at least 4 years experience in RPG II, preferably being gained in an ...
IBM environment.

The successful candidate will additionally be involved in the analysis and interfacing of various automated office projects into a rommon network. Usual banking benefits apply.

Contact: David Hendry

Banking Analyst

The London branch of this prestigious European bank is about to cinbark on a major

The London branch of this prestigious European hank is about to chibant on a major programme of new applications development and is seeking an experienced Systems Analyst to play a key role in this project.

Experience must consist of at least 18 months Systems Analysis in a Brinking chvironment coupled with a knowledge of foreign exchainge and/or money market applications. Long term career prospects are excellent and a good salary is supplemented by attractive fringe benefits.

Contact: Isobal Brace

Senior Programmer

#9,000+

City

Ideal opportunity to join a well established financial organisation who are in the process of installing two DEC 11/70's

To apply, it is essential to have at least two years experience in a DEC crivinorintent using BASIC+/BASIC+2. Also to have good knowledge of financial applications, plue the

BASIC+/BASIC+2. Also to have good and heliproblems.

ability to deal with users and their problems.

Promotion prospects are good os this is a new and developing installation.

Contact: Janet Chilvers

JAMES BAKER ASSOCIATES. International Personnel Consultants. 32 Savile Row, London WL

Tel: 01-439 9311.

SOFTWARE

TO £11K

Practical experience in design computer systems for eutomation/real-time process control and monitoring applications. Languages high level and

(PK1511)

00

00

CHIEF PROGRAMMER E13.5K + CAR

7 years' experience of IBM environment - Ability to promote and maintain the highest standards of program development - Familiar with latest IBM methodology - COBOL installations - Information Retrieval - Distributive

ANALYST/ **PROGRAMMER**

A minimum of 2 years' Commercial experience, including 1 year COBOL pref. on IBM or HP to develop business related computer systems. CICS, ICCP, IMAGE, VIEW or QUERY as asset.

(PK1514)

00

00

ANALYST/ **PROGRAMMER**

Senior position with min. of 2 yrs.' PL1/FORTRAN/COBOL exp. IBM configuration working on Manufacturing applications totally committed to DP. Excellent prospects and training.

ANALYST

6 yrs.' enslysis exp. from prog. background - generel business epplications - Twin 4341e using DATA BASE - eubstantial company benefite

(PK1513)

£13K + Mort.

00

S'WARE PROG.

£13K + Mort.

MVS S'waro prog. -- 4 yrs.' + exp. to work in rapidly expanding site, current plans include a second mainframe, large MINI plus state of the art software.

PROJECT LEADER

TO £12,000

Our client requiree a proven ensiyst with leedership experience who is capable of seeing projects through. Experience in order entry, involving end stock control en esset, es is femiliarity with Hewiett

(JA1504)

00.... 00

TECH. SUPPORT

7 yrs.' + in DP? Experience with terminal and database orientated systems in commercial environment? Support endusers in banking and financial sectors. Superb benefits in addition.

SENIOR SYSTEMS **ANALYST** £12K + CAR

You're an analyst with an IBM programming background and axparlanced in financial or insurance applications. You've been in DP for five years and you want to join a small team about to embark of major developments. You'll be contecting us today. (JA1451)

00

SYSTEM **PROGRAMMER**

S.E. LONDON

Maria Company of the Company of the

C. £11,000

Five years' plus, two on IBM systems. Experienced in MVS - software evaluation, installation and performance. IMS, T.P. Package includes subsidised mortgage.

CHIEF

PROGRAMMER
CITY
Could you lead a team of 15
programmers? If you're educated to
dagree level, and have 5 yrs. experience, some of it on Honeywell 64 or 66 in on-line environment contact ue (NW1454)

00 00

Graduate with 4 years' + experience MACRO 11 on PDP11s, with RSX 11M to lead team on design and productions of software systems for industrial and

PROJECT LEADER

(NW1281)

00

perations

ME29 Epsom

c.£8,000

Our client is a financial organisation based in a pleasant country house in Epsom, Surrey. An ICL 2904 is currently installed, but this will be replaced by an ME 29 in April.

An Operations Controller is required to take responsibility for the data control, data preparation, computer operations and technical support functions, currently employing 9

The ideal candidate will be mature, with a strong ICL. 2903/4 background and will have had previous management experience. Training in ME 29 concepts and Techniques will be provided.

The company is friendly and professional, and benefits offered include 50p Luncheon Vouchers, good pension scheme and six monthly salary reviews.

For further information please write to, or telephone Pal Barnes quoting ref; CW104-1P.

CAPP ASSOCIATES 01-686 9693

Capp House, 96 South End, Croydon CR9 3SD Computer and Professional Personnel Consultants

Passport required

Data Processing Supervisor

With Analyst/Programmer skills

c.US \$34000 **Major Benefits**

Major Locations South America

Africa

Far East

EuropeMiddle East

 High Salary Excellent Benefits

Secure Employment

Free Trips Home
A Company That Cares

The Company offers specialist technical services to the oil industry world-wide. Part of an international molti-million pound group, it employs over 4,000 people in more than 40 countries Overall computing sharegy is controlled in London but each major location has its own computer as does each unit within those locations. There are 15 machines in all (20

The First Assignment is that of DATA PROCESSING SUPERVISOR in Tripoli (Libya). The major responsibility will be to install a new IBM system 34 computer and various financial and management information packages.

The Applicant should ideally have a mini-computer background (perferably IBM) and knowledge of RPGII. He is likely to be single with the drive and initiative that the job demands, modified by diplomacy.

Contact TONY STAPLES for more information and an application form or send cv in confidence.

occ computer personnel 01-242 9356 24 hour enswerservice



Specialists since 1971 in UK & International computer and technical appointments. Please contact us for

16 Bedlord Row, London WC IR 4EB. Telex 24224 ref. 1163

SYSTEMS ANALYST

FINE ART AUCTIONEERS

LONDON, W.1 C. £9,500

Our Client is the foremost firm of international Fine Art Auctioneers in the world with sales of £235 million. The continued growth and increasing sophistication of the business has created the need for further systems development and therefore the appointment of an additional Systems Analyst;

You will join a small but busy team developing integrated databases in a real-time environment on a Burroughs mainframe where you can expect to achieve a high-level of job satisfaction and career advancement.

We expect you to have a COBOL programming background and at least two years' systems analysis experience which should include seeing a system through from start to implementation. Experience on Burroughs equipment would be an advantage but is by no means essential.

For further information on this exceptionally interesting position, please contact MARK IRENS, ADVISING DIRECTOR, quoting reference CW0502/1

HUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE, HUTTON STREET LONDON ECAY SHP.

TELEPHONE OF 353 7141 (24 HOURS)

DATA **COMMUNICATIONS** SALES EXECUTIVES

SENIOR SALES EXECUTIVES

C. £18,000 per annum

COMPANY CAR, EXPENSES AND USUAL BENEFITS

VACANCIES IN THE HOME COUNTIES, WEST MIDLANDS.
AND THE NORTH WEST

This British manufacturer based in the Hertfordshire countryside has built an enviable reputation, particularly in the field of Data Communications.

They manufacture and market a wide range of equipment, all designed to enhance and apedarp the transmission of data and voice traffic, thus reducing telephone and telegraph charges.

The equipment is excellent and therefore very marketable and all the Company's Sales Breefitives exceeded their quotas last year resulting in a turnover of £12 millioo.

If you are a second all the company is a surnover of £12 millioo.

would like to flear from you. The Company is expanding rapidly and vacancies exist in the Home Counties (North and South), West Midlands and the North-West. Why not become part of this success.

Telephone BOB BOWER, ADVISING DIRECTOR for further information and to Ref. CWO502/2

HUTTON EXECUTIVE SELECTION STD. HUTTON HOUSE, KUTTON STREET, LONDON ECAY SHP

YELEPHONE: 01-359, 7/81 (24 HOURS

TECH SUPPORT/SALES

N.W. LONDON

£12K + CAR

MICRO manufecturer - selling to and aupporting distributors prepared to travel abroad - solid DP beckground plus experience of

PROJECT LEADER

BEDS

£10,000

World-leaders in the menufecture of high technology analysera for Research & Production Control require expertise of RSX or RT Op Systems. Knowledge of MACRO FORTRAN or BASIC essential. Proven leadership qualities.

CONSULTANT

TO £16,000

First-cless graduate whose experlence was geined in lerge software house with e menufecturer or in a large installetion. You'll be convereant with DP stretegy etudies, aystems reviews, hardwere and apftware aelection and project men-

annet etalestalaituonia. Valgasta en edus

PROJECT LEADER

BUCKS

C£11K

5-6 yra, total DP exp. Incl. ICL or Univec. Femiliarity with Databeae techniques or COMMS would be a distinct edvantege. User-lieiaon expertise - decision maker -

ANALYST

BERKS

£10K

Analyst from Tech. background to join progressive distrib, company involved with on-line DATABASE to encompass 6 original locations with INVENTORY CONTROL being the first melor application.

GIBRALTAR

SYSTEMS

CONSULTANT

If you have previous pre-post sales

eupport experience, self motiveted, can convey ideaa, solve problems and have knowledge of comms and distributed processing then our

client would like to meet you.

Phone today - quote

ANALIPROG.

MIDDX.

Deta Dictionary DB/DC

Design

At least 2 years' experience RPG2 on \$34 will give you the chance of 2 years in the sun with your family. Package includes free family passage, subsidised accommodation plus 25% gratuity at end of assign

DATABASE

Performence monitoring

8ack-up Recovery

ADMIN.

TO £14,000

TIME-SHARING

Analyst/Progremmer with 3 yeers experience on IBM OS Systems required for management Informe-tion ayatems work utiliaing Report Program Generators end personelcomputing fecilities. APL knowledge an esaet.

10-14-pags

Computer Search Ltd. 01-404 0152

Norwich House, 13 Southampton Place, London WC1A 2AJ

International Personnel Consultants
Modus Management Services Limited 148 Watling Street, Radlett, Herts. WD7 7JH

Telephone: Radlett (09276) 3077

WE NEED ANALYSTS!

Yes we need real Systems Analysts. People who excel at extracting information from a multitude of users, people who can gain the full confidence of user departments, including senior and operational staff, helping them find out what they want and helping them to decide what they really need. A military system background would help but is not a pre-requisite.

£10,500-£13,500

Plus benefits package which includes: Bupa, free season ticket loan, relocation expenses, pensions, etc.

Systems Concepts

Imagine the ecope and freedom an Analyst reelly needs to do his or her job properly. The freedom to encourage users to give information without the restriction of a pre-conceived sizing of the mechine or inatellation or system, the freedom to produce a totally comprehensive requirements specification, the scope that comes naturally from being there to analyse rather than impose e solution, the edditional freedom thet results from having a first-clesa team of eoftware and communications designers to back you up. How often have you worked In conditions as ideal as these?

The task our client hea set is ea comprehensive as these perameters indicete. The decisions to be made from your work will identify not only the detelled espects of the system design but also the benefits to be derived from e computerised solution, the costs such a project would Incur end the time-acalea for implementation.

What is certein in thet the system will be multi-user end multi-locational end that the most up-to-date technology will heve to be used. The overall objective is an extremely execting one to achievel

Professional Background

Your experience to date must indicate eound, thorough Analysis — not just design and programming. Most people at this level will have taken responsibility for a substantial system development and we will expect to ace some evidence of flair, imagination and self-relience. A degree or equivelent professional qualification would be a considerable asset, whilst knowledge of such techniques as date enalysis, extremely

in view of the growth factor and the wey in which our clients assign etaff to project work, there is no doubt that there will be progressively more room for extremely senior consultancy and project menagement positions as time passes. Additionally, our client's approach to project control and system design is entirely modern and exposure to these methodologies is certain to enchance and increase individual professional capabilities.

Opportunities exist within, or heading-up, the various design teems end the positions would suit applicants who ere already at Senior Analyst level.

Interested? Your career may need the kind of boost that working on this system will give. The company you would be working for is recognised world-wide as one of the very best, as well as being one of the largest in the computer industry. Your security and professionslism cannot help but be enhanced.

Contact: Andy Wright or Mike Creamer

COMPUTER SCIENTISTS/ENGINEERS

for Development of Numerical Engineering Systems

Kongsberg Data Systems have established an additional Software Group in the Maldanhead area to carry out development of several products in our Numerical Engineering Systems range.

We need an anthusisatic software analyst/programmer with Engineering Computer Science or Mathematica qualifications with the experience to design and implement impovative systems in CAD, CAM, NC and integrated manufacture. Occasional oversees travel is to be ex-

pected.

Experience in FORTRAN, ASSEMBLER, PDP11, RSX11 would be relevant. Enthusiasm to work affectively in demanding projects and an ability to work to exacting time accepts its valued sa highly as accepting qualifications. Salaries are competitive, with SUPA and other accial benefits. Raiocation easistance is available as appropriets.



Please write to or telephone for an application form to: KONGEBERG LIMITED Data Systems Division St. Peter's Road Maldenhead, Berks Tel: Maldenhead 20202

COMPUTER ANALYST/PROGRAMMER lenulred for Computer Company based in Hampelin Specience of Bésic is important and avidance of pr gramming ability required.
Please write in first instance to:

A flan

1 hyttpn Road, Petersfield, Hampahire

1.512

Software **Opportunities**

ANALYST PROGRAMMERSup to £12,000

An expending research programme Opportunities are for has greated adversi vacancias in our Computer Services Group for Analysi Programmers with at least 5 years' relevant experience. Vacancies also exist for recent graduates in computer science or related topics.

The Group provides support to scientific and manageriel staff of the 1600 strong R & D establishment using a number of mainframe and mini computer systems including Univec 1100. DEC PDP11's and a variety of desktop

Conditions of employment are first-oless with a non-contributory panelon scheme, subsidised funches and excel-lent aports and social club. Attractive careers are open to computer sieff throughout the extensive computer fecilities within the SP organisation.

Applicants, agad 22-35 yeers, should donted: Mrs. Linds Fuller, BP Research Centre, Chartesy Road, Sunbury-on-Thamas, Middlesex TW16 7LN, Tal: Sunbury \$1234, ext. 634.

TECHNICAL

Expariance in some of the following is desirable: FORTRAN, BASIC, OS 1100 PWS/UNIX, RSX11M, data commun cationa, systema programming of in

COMMERCIAL ANALYST **PROGRAMMERS**

to Work on financial and accounting projects, a knowledge of Univer 1100 COBOL is assential with Oatabase and , information retrieval an advantage. 🦙

Research SUNBURY-ON-THAMES

Ld Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultents to industry and Commerce since 1962

MIDLANDS

ANALYST PROCRAMMER: COBOL/ASSEMBLER ISM Installation DOS VSE

who are No. 1 in Irial riski.
South Birminghem to £8,000.

ANALYST: ICL Installation D3

Work in a large department of Company Dervice Industry.
Luxurious offices and annual Increments.
South Birminghem to £8,500.

PROORAMMER ANALYST: SASIC/MACHINE Cods with knowledge of PET/APPLE and Business Applications.

Problem solving for customers with definite prospects of promotion inc. Company car.
Routh Birminghem to £8,000.

SYSTEMS PROORAMMERS: COBOL/ASSEMBLER IBM

Prestigious Company expanding their Technical Support Department. Knowledge CICS VTAM/ICP required. Excellent

Department. Knowledge CICS VTAM/ICP required. Excellent promotion prospects.

West Similinghem to £5,600 + excellent fringe benefits.

PROCRAMMER: COSOL/ASSEMSLER/RPQ, DOS, VSE Join Technical support feem of group OP department. Sesed in West Bromwich with occasional travel to other eites. To £6,000.

PROCRAMMERS: SASIC + R.S.T.S. with DEC experiencs Expending Company Turnkey suppliers of Computer systems. Occad promotion prospect to £8,000 + CAR.

ELECTRONICS ENOINEERS: £8,000

Plenty of verlety include design and development. Interfection

PLECTHONICS ENGINEERS: £8,000
Plenty of veriety include dealign end development. Interfecting Minis with NC Mechinery.

SOFTWARE OEVELOPMENT ENCINEER: £6,000
Recent graduale considered. Develop edentive Control Rystems. Fortren experience needed. Bright prospects with leaders in Computer Aided Dealign Equipment.

FIELD SERVICE ENCINEER: £7,000 + CAR + C/T Challenging and verlad work on Mini, both Commercial and Industrial applications.

Phone: ATA COMPUTER RECRUITMENT 021-843 1994 Woolwich Building, 192 New Street Birmleghern S2 4HO

HERTS & ESSEX

HERTS		
PROGRAMMER	16 months BASICI	£6000 +
PROORAMMER	(t2 months CO SOL)	£6000
JUNIOR PROSRAMMER	(6 months COBOL OR ASSEMBLER	£8500
PROGRAMMER	(2 years CO BOL)	£3500
ANALYST/PROBRAMMER	(2 yaars RPGII or IBM	£9500
CHIEF PROGRAMMER	(Backgraund in BASIC)	£8500+CA
SENIOR PRO ORAMMER	(3 years COSOL)	E10,000
SPECIAL ASBIONMENT	(IBM, COBOL +	

ESSEX PROGRAMMER 18 manths PL1 12-3 years COBOLI £8750+ SENIOR SYSTEM: PROGRAMMEN

HERTS/ESSEY ROBDERS

HELLION FOREN DA	IIDPIIO	
PROGRAMMER	118 months PL1, or COBOL)	€7500
ANALYST	(3 years experience)	£8500
ANALYST/PROGRAMMER	12 years CO 80 L or PL1	£8500
PROJECT LEADER	M years Programming +	£9500 4

Phone: ATA COMPUTER RECRUITMENT Bishop's Stortford (0279) R08464 28 Regiow Lane Siehop's Stortford, Herts.

[01] 637 0781

(061) B32 5856 86 Cross St. M2 4LA

Opportunities in the U.S.A.

Arbat Systems Ltd., a division of Arbat Consultants

Analyst/Programmers

Business Analyst/

including full medical coverage

Mr. David Lawton, Stall Manager ARBAT (UK) LIMITED IGUT Jugen Victoria Street London (G.4V.4DA)

management.

is expanding its operations in the United States and

offers the following opportunities to suitably qualified

At least three years experience in international banking systems development using high level languages and

Implementation Specialists

Successful applicants will probably have at least five

years experience in international banking including

foreign exchange and money market operations

and will have had one year's experience in project

The above positions which will be based in New York and will be initially for two years, possibly leading to

permanent positions for those who demonstrate above

The Company offers excellent salary and fringe benefits

Interviews will be held in London between 16th and 27th February.

Please sond detailed résume in confidence to:

(021) 643 1994 Wretworth Boilding

£ to 10,000

Equity and Law Beliding 36/38 Baldwin St.

NETWORKS

PROGRAMMER

Applications are invited for the above post which is available for one year. The main duties of the post are to support and develop software for a SEC 4090 computer which is to be used as a campus packet awtiching exchange. Knowledge of GEC computers and communications protocol, sepecially X20 would be an adventage.

Six còpies al applications and cirricula vites (one from averseas candidatas)... namino threa relates, should be sent by 20 February. 1991 to the Registrer, University of York, Healington, York YO1 5DD, from whom Jurthar particulars may be obtained. Plans quote reference number 13/8061.

DEPARTMENT OF

LECTURER

piperishes.

splication forms and furtisel, partiulars may be obtained from the
selector. The University, Leads 182
17, gualling reference sumber88/54/2. Coaling date for applicalete; 27th February, 1881.

[4310]

BOX Nos.

(031) 226 5381 Anglia House 24/28 Fraderick St.

(0293) 5i 407i 36 The Broadway

SOUTHAMPTON (0703) 37555 23 Cumberland Place SD1 288

WEST COUNTRY & WALES

OPERATIONS MANAGER (ICL OIL o. £8,000

PL1 PROGRAMMER a. £8,000 + fringe benefits Manufecturing Company require experienced PL1 programmer who is fully conversent with CICS.

ICL COSOL PROORAMMERS to E10,800
Experionced COSOL Programmers with T.P. and Flistab
knowledge required for 2870 installation under VMES.

RPOIT PROGRAMMER to £7,000

Experience of Commercial applications in busy bureau environment. Knowledge of COSOL beneficiel.

ANALYST PROGRAMMER to £8,000

COSOL Programmer with some Analysis experience to work on finencial systems. Good promotion prospects to Project Leader level.

SYSTEMS ANALYST £8,000 neg.
Minimum of 3 years' experience of Systems Cesigners. The Company has installed a network of Mini Computers to replace their maintrame, High content of development work.

SYSTEMS PROGRAMMER £10,800

general. CICS PROGRAMMER to £7,000 + Fringe benefits

To work in preparation of peckagos being developed for upgraded hardware. Knowledge of Teak Mester, PL1 in an OS or MVS anvironment an adventage.

ALL THE ASOVE POSITIONS OFFER GENEROUS RELOCATION
ASSISTANCE

Phone: ATA COMPUTER RECRUITMENT Selstol 10272) 211038 Equity & Lew Suliding 38/38 Baldwin Street &\$11NR

WHEREVER YOU ARE, WE'RE ON CALL TO ASSIST YOUR CAREER

ELSEVIER SCIENCE **PUBLISHERS**

Elsevier Scionce Publishers, belonging to the Elsevier-NDU-concent has vaconcies in the Datolanse Division of one of her working-companies EXCERPTA MEDICA B.V.,
an international Amsterdam-based publisher, of biomedical books and

journals and producer of one of the largest biomedienl databases in the world. Required are:

senior systems programmer/analystm/f

for systems development and maintenance of our PDP-11/RSX-11M.

A very sound knowledge of PDP-11 and RSX is required; knowledge, of VAX/VMS and DECNET would be advantageous.

senior applications programmer/analystm/

for database applications and development.

A relevant background of database work is needed, together will PDP-11/RSX-IIM experience. necessary as well as the ment Manager p 10% ability to work both tel. 020-254438

A knowledge of ... MACRO-11, Fortran and at least one other highievel language is necessary for both posts, and experience. in a commercial, database or text-processing environment is desi-

Independently and as part of a team. Salaries and conditions of service will conform to those applicable in. the Elsevier companies. An ability to communi-

Sent to Excerpts Medica B P.W. Lord P.O. Box 1126 1000 BC Amsterdam the Netherlands guoting number O14/021/CW Closing date (or not see the control of applications) (a) Purther information bate with users and may be obtained from the Systems Develop-

Applications cad R

Malaysian Head of Computing Standards and **Techniques**

Sarawak Shell Berhad and Sabah 434), and preference will be given to Shell Petroleum Compony those with DL/r and CICS experience. At the end of this year VM Limited now have an opening for a Malaysian to be Head of Standards with CMS/APL will be introduced. and Techniques, based in the For this senior appointment, the toformation and Computer Services initial salary will reflect your qualifications and experience, and could be Department at Lutong, Malaysia. Leading a small Jeam, you will be up to M.R. 54,000 per annum. We offer free medical treatment for you responsible for all systems software standards and techniques, and must and your immediate family, plus attractive bonus and pension be self-motivated and capable of schemes. A housing allowance is provided and reasonable relocation working in the challenging and growing environment of this major oil expenses considered.

You should have a degree or equivalent in computer science nr a science subject, and at least 4 to 5 years' systems programming/standards and techniques experience with 1BM equipment using DOS/VS or DOS/VSE plus a thurough knowledge of IBM assembler language. The Department operates an IBM

Mrs P. W. Frise, PNEL/41 (C6), Recruiment Division, Shell International Petroleum Company Limited, Shell Centre, London SEI 7NA.

The Personne Planning Department, Sarawak Shell Berhad, LUTONG,

directly to Lutong.

SOFTWARE DESIGNER

ENGINEERS

Mitel is a dynamic, rapidly expanding telecommunications manufacturer than engineering and marketing base in Maldanhead. As a company we are cossful and embitious.

Phanomenel growth has created a number of vecencies for softwere sign engineers, men or women, with real-time end essembler experience to ntribute to the development of our PABX systems.

If you have between 1-5 yeers' experience, we can offer you a stimulating ork environment, attractive selected and the opportunity to metch your growth

Contact John Dommett, Paraonnel Meneger, Mitel Telecom Limited, Hamilton Road, Slough, Berke, telephone Slough 76121, extension 221, for en application form end further details.

PLAN YOUR CAREER WITH PRESCOT

ENGLAND, NEW ZEALAND

SOUTH AFRICA & AUSTRALIA

Careful planning often makes the difference between the successful and the not so successful computer career. Prescot Computers understand this because we specialise in oversees computer recruit nient said the selection for an oversees post requires extra care by Prescot, amployer and amployee, we

computer recrifithient and the selection for an oversess post requires extra care by Prescott employer and amployee. We use the same principles of care whether UK only or oversess employerent is thyolyed.

We stways wish to interview PROGRAMMERS, SYSTEMS:

ANALYSTS, ANALYST PROGRAMMERO, CONSULTANTS AND SALESPEOPLE for a broad range of clients in England. Australia. New Zesiand and South Africa. Salaries range from CL000 to \$18,000 p.a. If you are telegrated; why not telephone chad Stolper on \$1.434 2888/9 fbr an informal discussion.

Alternatively if you breise write to film at PRESCOT COMBUTERS LIMITED.

you are interested in this position,

please write giving personal, edu-

cational and employment details, and

marking the envelope "Confidential -

Head of Computing Standards and Techniques". Closing date for appli-

cations is 27 February, 1981, and

candidates in Malaysia should write

DATAVIEW LTD

MICRO

COMPUTER

PROGRAMMER

A programmer la requirect to Join our active MICRO BUBINESS SYSTEMS

HOUSE: The Ideal appli-ent will have a good back-ground in Business Appli-oatton, Program mea. In BASIC, PASCAL and CO-BOL as well as experience in Z80 and 6502 Assem-bler.

bler: A good ramunaration package is offered.

Write to the Managin

Director DATAVIEW LTD

9 CHURCH STREET COLCHESTER ESSEX CO1 1HF

SYSTEMS ANALYSTS

Broaden your Horizons

£10K — £12K

International Management Consultancy

The Company

is one of the largest British management consultancies, with headquarters in the City of London. Part of a famous Accountancy firm with offices in over 90 countries, they have gained an excellent reputstion for providing D.P. services to cilents throughout the world.

Your Role

as Consultant within the Systems Development Group will be to undertake a wide variety of projects, ranging from advising companies on their first steps to computerisation through to leading teams designing and implementing sophisticated systems on mainfrance and

The requirements are stringent —

with the reputation and prestige our clients enjoy, they rightly demand exceptional capability in their Consultants. You must be aged 26 - 30 and have a degree, 2/3 years solid systems experience and proven success on at least one major project. Add to that strong personal and communication skills, industry awareness and a high level of management potential and you begin to meet our clients needs.

But the rewards are excellent -

varied and challenging assignments in the U.K. and overseas — activities of the team in 1980 have involved projects in the West Indies, Southern Africa, the U.S.A. and Holland — a sound career path in professional D.P. consultancy, with the opportunity to progress into general management consulting roles; first-class training in computing and management techniques; and, perhaps most importantly, the station and valuable experience to be gained from performing a prime role in one of the world's leading professional groups.

For a strictly confidential discussion on these opportunities, telephone Barry Latchford on the number below, or on Newick (STD 082572) 3197 after 7.00pm. Alternatively, write quoting ref. CW167 enclosing a brief career history. Initial interviews will be conducted in London.

Barry Latchford Associates Tel. (0444)

Blair House, Haywards Heath, Sussex RH16 3PH

`5981*5/6/7*

PROGRAMMERS

CONTRACTS

OS Systams Programmer — Holland Cobol CICS - C. London **DL/1 Programmar** Cobol CICS DL/1 Programmars OS Cobol Programmers - Kent PL/1 Programmers - Kent PL/1 Programmer

CICS Programmer

FORCE 8 Computer services 8 Mint Walk, Croydon, 01-680 3761

W. London

and the state of t

IMS DS/DC: Troubleshooters CICS & DL/1 Designers & Progs IMS D'base Administration * Indop. contracts * up to double perm. sals.*

CONTRACTS IN LIBYA DEC FORTRAN PROJECT LEADER ANALYST/PROGRAMMER

£16,000 - £21,000 TAX FREE

Plusi Generous home leave, free travel, food and accommodetion.

Initial contract 1 year. eferebly with experience of PDP/11/34 RSX11M, plus knowledge of all production end pipelins process controls. /

Rod Smith ATLAS COMPUTER CONSULTANTS LTD.

Manchester Road, Bolton BL2 1EX Tel: Bolton 24117/8/9

WANTED SALES REPRESENTATIVE

A challenging ground floor position markeling a quelity citility software package. Excellent remunaration expected

MR. IAN WESTCOTT or MR. PHILIP HART ON 01-739 8287

MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

SOFTWARE PRODUCT **SALESPEOPLE**

Basic Salary £10-14K

U.K. and European Assignment

An Internationally respected company providing professional services in computing, communications and management sciences has put together a team of highly qualified software engineers to supports its XENIX-UNIX related software products and services both in the U.K. and in Europe.

They have asked us to identify a SALES EXECU-TIVE capable of spearheading the project into the end-user market-place.

Targa

A slie in North London hee e requirement for a OEPUTY SHIFT LEADER. The successful applicant will have extensive knowledge of OS/VS1 and MVS and be expected to provide proven supervisory expertise. The current hardware configuration comprises an IBM 370/158, Opportunities exist for carear advancement. Pleasant working sonditions will be found in a quiet pert of London on the Middlesex/Hertfordshire borders. Ref. 3223.

A lerge well-known company in West London requires an Operator who is experienced with both VME/B and Glis operating systems. A twelve-hour shift canteen, non-contributory panalon scheme, Christmas banus and voluntary overtime, Ref: 3190.

A computer user based in West London has a requirement for various staff in their Operations Department. The vacancies they wish to fill range from an OPERATOR with a minimum of 1 year's expariense to a SHIFT LEADER with a minimum of 2 years end an OPERATIONS SUPERVISOR with proven exills of man-management. A detelled knowledge of OOS/VS, POWER/VS end CICS is a prerequisite for the sanior positions. Ref: 2463:

An Operator vacancy extats within the Computer Department of a well-known Company based in West London. The necessary requirements for this post sits a minimum of 2 years' experience on ICL 1900/2900 hardware and knowledge of Gill is a must; A three-shift system is currently in operation which starts on a Sunday night giving Friday nights off, Ref. 1496.

A large Group of Companies whose Computer Department is situated in Surrey require a SHIFT LEADER with at least S-4 years experience of IBM 370 end/or IBM 4331 series herdware, utilising DOS/V8; POWER/VS, CIGS and DL/1. They also have a requirement for an OPERATOR with at least 18 months' experience in rural surroundings. Ref. 2645.

Targa are always plassed to hear from experienced Systems, Programming by Operations staff. If your datest needs a boost, contact the office for an informal discussion with one of our consultance.

TARGA COMPUTER

SERVICES & LIVERPOOL STREET LONDON EC2M 7NH 01-283 9941

D88/V8(E)

RECRUITMENT CONSULTANT

Sales Division

If you reed the edvertisement on the left you will get some idea of the kind of essignment we ere called upon to hendle.

It is not ell "top level" stuff, we operate from entry level all the wey to Ganarel Maneger across e wide spectrum of the industry.

You will work at the level you cen sell to end handle. You will get the support you need from e lively team and the rewerds from e compeny who racognise whet telant is end how to rewerd it.

Contact Tony McGreth on 01-637 9611.

Suite 201/6 Albany House: 324 Regent Street London WIR 5AA 01-637 9611

MANAGEMENT& EXECUTIVE SELECTION

Excellent Contract Opportunities

eo plaase make sure you are on our regislar.:

	MAUVIA	Programmer/Analyst	Londan/Europa/ U.S.A.
i.	COBOL/OOS	Senior Programmers	W. Germany
	COBOL/CICS	Progremmers/Analysis	S. London
• :	COBOL/CICS/DL1	Senior Programmar/ Programmar/Analyst	N. West/U,S.A.
	BM ASSEMBLER	Programmar/Analyst	U.S.A.
() ()	POP (CORAL Preferred)	Senior Programmar	S. East
	rime/FORTRAN	Programmar/Analyst	S. London
ال د د	М .	Saniar Programmer	S, East
/: J	RL1/FORTRAN	Programmer/Analyst	N. West
	MUMPS/POP	Programmer .	London
	DL1/COBOC	Project Léeder/ Sanior Programmers	London/Far East
	urgapus	Programmer Analyst	u.s.A.

Alen King TANGENT COMPUTER SERVICES 102/105 South Street Romford, Essex Tel: Remford 780201

The following era e salection of our current Contract Assignments. However, we have a continuous requirement for exilled and dedicated Contract Professionals.

MARK IV	Programmer/Analyst	Londan/Europa/ U.S.A.	
COBOL/OOS	Sanior Programmers	W. Garmany	
COBOL/CICS	Progremmers/Analysis	S. London	
COBOL/CICS/DL1	Senior Programmar/ Programmar/Analyst	N. West/U,S.A.	
IBM ASSEMBLER	Programmar/Analyst	U.S.A.	
POP (CORAL Preferred)	Senior Programmer	S. East	
Prime/FORTRAN	Programmar/Analyst	S. London	
PL1	Seniar Progremmer	S. East	
PL1/FORTRAN	Programmer/Analysi	N. West	
MUMPS/POP	Programmer .	London	
DL1/COBOL	Project Léadar/ Sanior Programmera	London/Far East	
Argibus	Programmer/Analyst	u.S.A.	
TOTAL/ENVIRON L	Programmer/Analyst	M, East	
Ne Gipus	Sanlor Programmers Programmar/Anaryst	u.S.A.	

Our client is a very successful British company which during the leat two years has completed the first phase of a major programme of introducing edvenced computer systems besed profit and budgetery responsibility for an expenditure on e substentiel IBM configuration. must, therefore, be able to bring to the position not only Future plens include the wider use of detebese, communications and distributed processing covaring all eepects of the Groupe activities in the UK and Europe.

CENTRAL LANCASHIRE to \$13,000 + CAR

The offer of a Directorship in one of the Groups subsidieries has resulted in the vecency for a Computer Operations Meneger. This position reports directly to the Head of Menagement Services.

Specific responsibilities era for computer room, date control, communicatione plenning end support end ell softwere development end support within the inatelletion.

A top cless computer operations profassionel is required for this very eenlor position. Extensive operations management experience in en IBM environment le e pre-requisite for cendidetee ea is a thorough knowledge of the major current IBM herdwere end softwere.

The computer division operates as an independent profit centre end the Computer Operations Manager will have full exceeding £1.5 million per ennum. The successful candidate technical excellence in computer operations menagement, but elso commerciel ecumen which is importent to the running of the depertment as a successful commercial operation within this progressive Group.

An excellent remuneration peckage will be nogotieted including selery to £13,000 per ennum, company cer, non-contributory pension and BUPA. A comprehensive relocation allowence is evailable in appropriete cases.

Interested cendidates should send a brief carear history to Ivor Norton at the Harrogete office quoting reference CW/8103. No forms will be issued end complete confidentielity is quaranteed.

Ivor Norton Management Services Ltd RECRUITMENT CONSULTING DIVISION

LONDON 52, Sheftesbury Avenue, London W1V 70E 01 734 8882

HARROGATE P.O. Box 63, Copthal) Tower House, Herrogate HG1 1TS Harrogata 68628

GLASGOW 11 Bothwell Street, Glasgow G2 BLY 041 226 4811

24 HOUR ANSWERING SERVICE

Computer Professional Recruitment Consultancy

Nationwide Computer Services Company requires an

Area Sales Manager

To take resposibility for Sales in North West England (to be based in Manchester)

- You will be Aged 28-40, with a good business/commercial systems background. Experienced and successful in sales of services-

 - orientated products, e.g. Bureau, Time-shere,
 - Treined, ideally siready experienced and successful in seles men-management and
 - motivation.
 - Used to controlling negotietions with large national companies as well as first time user
 - Prepared to spear-head the selling efforts of your team. Required to maintain the business expansion of
 - this successful compeny.

You will"

- A base selary commensurate to the responsibility. receive
 - Attrective performance based bonuses, with first year guarantee. Choice of 2-litre oar.
 - Attractive fringe banefits.

A top class opportunity for a top class professional

Respond In writing with GV (atrict confidence guaranteed) quoting K34 ta:— CPR Consultante Ltd.; Sulta 29, Concourse House 432, Oewsbury Road, Leeds LS11.7DF. Telaphona Leeds (0832) 774040 - 24 hours griswering service.

Chief Buyer

Systems Purchasing c.£7,000

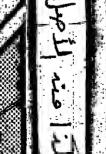
We are a mejor systems house with a central computer facility specifically formed to provide and develop computer systems, communications and allied functions. The very size of the systems operation entalls considerable expanditure on services, moterials

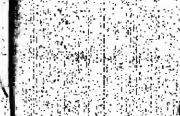
We now require a Chief Buyer located at our heed office in Reddilch. Reporting to the Purchesing Manager, the successful candidate will require proven skill in negotietions with suppliers and the ability to obtain commercial terms best suited to the company Consideration will be given to experienced systems personnel with a desire to move into a commercial environment.

The personal qualities and experience sought will be rewarded with a salary of c. £7,000 relocation assistance (where appropriate), 5 weeks annual holiday and other benefits expected of a progressive employed Company products, including cers, are available at discounted prices.

Candidates, male or female, should write in complete confidence, giving detalls of aga, experience qualifications, career and salary record to date, to:-Bob Davies, Personnel Development, BL Systema Ltd., Grosvenor House, Prospect Hill, Redditch, Worcs,







RPG II ANALYST/PROGRAMMER TO DEVELOP HIS/HER OWN INSTALLATION

Cimex, Europe's leading floor machine manufacturer, and a member of the Thomas Tilling group, are looking for an experienced analyst/programmer to take charge of their IBM system 34 installation at Orpington.

You will have a sound knowledge of RPG II plus a good analysis background, ideally on System 34 with MAAPICS. If you have gained your experience in a manufacturing company and have specified, designed and implemented stock control and ledger systems then this is an added advantage, because your top priority will be to install the accounting functions of the MAAPICS package and develop the stock control aspect.

The position carries a DATA PROCESSING MANAGER title and you will be part of an active management team in this multi-national company. As you will appreciate, therefore, user liaison is an important function of the job. The company is expanding and the successful applicant will have the opportunity to develop the installation to support this expansion.

The position carries a starting salary to £9,500 and all the normal large-company benefits including RELOCATION, if needed.

CONTRACTS

OVERSEAS

IBM COBOL DL/1 PROGRAMMER: The Hague MINI BASIC ENGINEERING BACKGROUND PROGRAM-

UK

01-734 0152 (24 hours)

Royalty House, 72, Dean Street, London W1.

idon Mancliester Birmingham France Holland USA: SA

BUSINESS ANALYST—BANKING EXPERIENCE

MICROS - ASSEMBLER FORTRAN

IBM DOS PL/1 CICS PROGRAMMER

IBM SYSTEM 34 RPG2 PROGRAMMER

IBM DOS COBOL CICS PROGRAMMER

IBM COBOL FORTRAN PROGRAMMER

IBM PL/1 DATABASE EXPERIENCE

IBM OS PL/1 CICS PROGRAMMER

Amerstoor IBM SYSTEMS AN/OESIGNER ASSEMBLER Amsterdam

WANG VS COBOL PROGRAMMERS IBM SYSTEMS PROG, CICS ASSEMBLER ,...

interested, then contact...

TUNBRIDGE WELLS 35712/3 (0892) (24-hour service)

PDP AIMS PROGRAMMER

IMS ANALYST



RECRUITMENT AGENCY

14 MOUNT PLEASANT TUNBRIDGE WELLS KENT TELEPHONE TUNBHIDGE WELLS 35712 3 4

Development Programmers Extendour lead in Computer Aided Design

Racal-Redac Limited pioneered the development of computer aided design. To-day we are renowned worldwide for our interactive graphic PCB layout system which combines a DEC, PDP 11/34 with our sophisticated software to produce a rechnologically advanced and 'easy to use' system-

Our success has resulted from our total commitment to advanced development, a commitment that has constantly kept us ahead of our competitors in the CAD electronic design field.

We intend to maintain our lead and are currently developing a range of 'new generation' design systems for a variety of applications and we are confident that we will extend our lead into mechanical design, integrated circuit layout and circuit analysis.

Our future development programme is ambitious and we have vocancies for Programmers at all levels to work in small reams on 'state of the art' development projects...

Applicants (male/female) will hold a referant degree or HND and will currently be involved in developing user orientated systems preferably using Fortran or other scientific languages.

Redac have recently opened a custom built development laboratory, with excellent facilities and computers used solely for development purposes.

Future expansion at Redac will give tie to excellent promotion prospects and these resition represent an ideal opportunity to become established in one of the most beautiful areas in England. Please apply with details of age, qualification

and experience ma-Brian Asherofr Personnel Officer Racal — Reduc Limited Newtown

Tewkesbury, Glos. GL208HE

Telephone (0684) 294161 Britain's fastest growing electronics group

SOFTWARE AND ELECTRONICS ENGINEERS

Various Levels

N. London

These chailanging new opportunities are with a progressive manufacturer in the forefront of a high-technological achievement in large OEM based usor systems, involving PDP11 and micro-processors. The product application is unique and, together with like backing of a major British group, aims to expand even further, its dominance of the world market. As well as providing the opportunity of keeping abreast of advanced technological change, these positions will encompass an introduction to optic and laser fields.

Software Engineers
Prime responsibility is for writing programmes for real time operation modules using RT11, RSX11 and MDOS operating systems. The design and development of total software packages will also incorporate the provision of epoclications to junior software angineers and to provide field support at product introduction stages.

Electronics Engineers
Haying goined experience of logic design in reletion to computer peripharala and analogus design for phased locked loops, high voltage amplifiers and noise reduction, you will be primarily responsible for detailed snalogue and digital circuit design including prototypa commissioning. The design of TTL and micro-processor electronics will also be of paramount.

Both areas require the ability to work a multi-disciplined team in a fast moving technical anvironment, providing you with the opportunity of gaining project control expariance.

Competitive salaries and benefits packages will be offered, as will the opportunity to grow with this rapidly expanding company.

For further details, with a view to a local interview in London, telephone Leicenset of the part of the p

QMS Recruitment

PO BOX 13. LEKESTER, LEI BOY

PROGRAMMERS

Programmers, exp: HSX | I M and Cord or Macro 11 geined in a continercial environment or good P1 exh reduced of P1 exh reduced or P1 exh r

FORCE 8

London

London

Middlesex

London

London

London

Computer services 8 Mint Walk, Croydun. 01-680 3761 SHEFFIELD CITY POLYTECHNIC

LECTURER IVSENIOR LECTURE IN COMPUTER STUDIES

Season or information processes. Incompany
The Department provides a Dysty and elimitated it reproperty for a wide range of academic work.

Builty Scale - Lii - Chin 2 Curos.

Application forms and turner details are available of the control of the contro

datascene

CONTRACT SALES MANAGER

LONDON, W.1

£20,000 +

Datascene, a member of the MDA group, has been established since 1975 as a leading computer recrultment company. The Contract Services Division, which has been running for 3 years, controls contracts in Frence, Holland and

We now need someone to fill the position of Controct Sales Monager. This person will have a professional sales and data processing background with a proven record of selling. Additionally, they must have the ability to organise and monage the Division, including budget forecasting. Applicants will be required to maintain and further develop the client base, particularly in Europe and the Middle East, and to lead the team of Consultants.

The package offered is:

* Basic salary (not less than £8,000 p.a.)

* Incentive commission (up to 30%)

* 2-litre company car

* Overseas travel

* 4 weeks' hollday

* Private Patients' Plan

We need someone who has a strong senae of drive and determination to work with a progressive company. Further, they should have the dealre to progress within the company where rewards are measured by results.

Plesse contact Mick Dauncey on 01-419 1856 or send a detailed CV to the

Batistoons International Limited. Seeming House. 199-113 Report Street. 199-113 Report Stre

college of swansea

LECTURER

Applications are invited for a vacency of Lacturar in the Department of Computer Science. Candidates should have a livet ar good secand class honours degree in entermance, computer science, or closely rolated subject legather with subsential posteriological research experience. Applications are well-came from candidates with research in any area of computer. come tram candones with tesserch intensits in any area of campules attended but these whose specialty is artificial intelligence or the de-velopment of special systems will be given penicular consideration.

e appeintment will data from plamber 1, 1881, and will be ada at the lawer and of the safen als C5,505 £11,575 par annum.

urther particulars and application arms (2 copies) may be obtained from the Personnel Office, Univer-ity College of Swanssa, Singleton ark, Swanssa SA2 SPP, to wisich ffice they should be returned by videy, February 27, 1881.

143721

TITE UNIVERSITY OF SHEFFIELD

MRC/SSRC Social and Applied Psychology Unit

> RESEARCH plicalians are invited tro

raduales in psychology or com uter accence to join o research roup underlaking experiments tudies of human factors in com atudies of human factors in computer programming and activate anginaering. Tenable for three years from a date to be arranged. Initial salety on Range 18 or 1A. Irom £5150 to £384 B a year. Some postgraduate experience is desirable, not necessarily in this liefd, atthough programming asperience is assential. The Unit is shortly taking possession of an advenced configuration running under Unix Bataria Irom Professor P. 8, Wart. MRC/85RC. SAPU. Dapartment of Paycho-

PROJECT MANAGER c£10,000+car

CENTRAL LANCASHIRE

Our cliant, a British company with a successful growth record, is totally committed to the continuous development of advanced computer systems.

A aubstantial IBM mainframa with Laser printer is installed togathar with savarat 81 00's at romota locations as part of a distributed natwork. Futuro davelopments include the extension of the natwork and further use of database

A vocancy axists for a Project Managar who will laud a team of aix analysts and programmars developing major systems.

The successful candidate will have a programming background plus 4 to 5 yasts systems experience including the successful management of asversi major projects from incaption to implementation. Significant experience in a mojor IBM instellation and experience of stack control and distribution cystoms would be odvantageous.

This is an excellent cereer opportunity for a young ambitious profosalonal to take on reapunsibility in a stimulating onvironment. Our client offers a salary circe £ 10,000, company car, non-contributory ponalon, BUPA and appropriate relocation expanses. (Reference CW/8104)

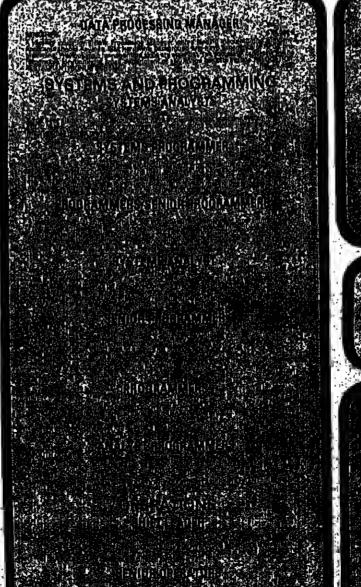
PROGRAMMERS & ANALYSTS £6000 to £9000

Are you ambitious with an IBM background, looking to develop your career? If so, we would like to talk to you about opportunities in this progressive installation. Salaries depending on experience. (Reference CW/8105)

interested candidatas should contact Ivor Norton in complet confidence at the Harrogata Office quoting the appropriate

Ivor Norton Management Services Ltd Recruitment Consulting Division

24 HOUR ANSWERING SERVICE (0423) 55311





Complete the coupon and return to Effectia 1 Gravis, National House, 66 Wardour Street, London, W1V 3HP, for your next PERMANENT or CONTRACT job.

Areas Prelanad, First Choice Second Choice

Experience to date: (Last Position First)

Network Support Assistant

CROYDON From £8,237 p.a.

Our repldly expending on-line Network (at present time one of the lergest of its kind), needs en edditionel Telecommunications/Date Specialist, to join our Network Control group, based et Regional leedquerters, Croydon.

The Oete Network et present consieta of epproximetely 800 terminele, etteched to IBM 3032/Amdehl V78 Processora. A further 50% growth is expected over the next few years including significant moves toward Distributed

Outles of this position will include:

- Operetionel feult diagnosie and rapelr
- Inetelletion Plenning
- Interactive end distributed proceesing
- Equipment commissioning
- Mein freme dete communications
- Against with new aguigment veiuellon/gelection

A considerable amount of travel throughout the region will be involved in this position, for which the appropriete cer ellowence will be paid.

The aucceeaful cendidete will heve et least 7 years' experience in the ebove disciplinee. HND/degree or

Please write, giving full detells and quoling ref: 0.6724 to:

Personnel Menager, South Eastern Gaa Segas House, Ketharine Street Croydon CR9 0JO

SOUTH EASTERN GAS 2

County of

0000

COMPUTER SERVICES UNIT Operating Systems Manager £8,910-£10,005

The Computer Services Unit provides a wids range of services from finance to computer sided designs to eli departments, including Police, es well es sil other Local Authorities within Cleveland.

Ws require an experienced software professional for this senior post within the Department Management Team, He/she will be supported by a team of six skilled systems

This post represents an opportunity to make a major contribution to an installistion at the forefront of computer technology. The unit uses IBM herdware and software to support an extensive terminal network, so that experisnce in such areas as MVS, DL/1, CICS, VTAM will be an advantage.

The post altracts a telephone allowerice and car allow

Assistance with removal and relocation expanses will be provided in approved cases. Temporary housing accommodation may also be available within the County area. The further fitternation write to: The Director of Computer Services. Reda House (5th Floor), 67 Corporation Road, Middlesbrough, Cleveland TS1 (LY, or telephone Kevin Narey on (0842) 248156, Ext. 2254/1.

COMPUTER **OPERATIONS** MANAGER

£10,000 + many benefits

A leading W.1 company seeks a mature person with at least 5 years ex-perience to take control of four staff in computer operation:

IBM 370/138 installations and Soft wars knowledge essential.

For more details please apply with full

SUE VENABLES Fleet Personnell 67-68 New Bond Street W.1 Telephone 409 3348/408 1612 **Unique Opportunity - Boston, U.S.A.**

SENIOR PROGRAMMER-ANALYSTS AND CONSULTANTS SYSTEMS PROGRAMMER

Our Clients are leaders in the Insurance, Food, Retail end High Technology industries. Boston-based with D.P. Instailations employing stete of the art systems.

ALL PROVIDE A HIGHER STANDARD OF LIVING U.S.A. STYLE

- Total benefits package (health, life, etc.)
- All relocation expenses

- Comprehensive program - for living and travel accom-

Competitive salaries range from £18K to 40K plus hardware – IBM 370/158, IBM 3033, IBM 4341. Software – Insurance CICS, CMS, DMS, Mark IV, COBOL DOS/VS. Food/Retails O.S./V.M., VS1, 1MS, COBOL. High Technology: CICS, MVS COBOL PL/1. Compiler Development, Data Base design.

Candidates must be highly motivated with correct qualifications and experience - minimum of three years - degree ideal but not essential. Candidates will be challenged but rewarded accordingly.

Please telephone Andrew Young for an application form at 623 8271,

> RHODES INTERNATIONAL C/O NETWORK PLANTATION HOUSE 4/16 MINCING LANE, LONDON EC3M 3HX

CHILTERNS

WORK ON NEW SYSTEMS IN A PLEASANT AREA, USING THE LATEST HARDWARE AND SOFTWARE

Our clients are expanding their DP services to cope with the development of major new systems and the installation of a modern mainframe. Database, on-line and financial modelling techniques are used, and remote minis with communications links are planned. We have been retained to recruit for the following posts:

PROJECT LEADER \$9,000-£10,500
Sound commercial analysis experience (probably over five years) and good leadership qualities are required; ideally with knowledge of database and communications. (Ref. 328CW)

SYSTEMS ANALYST £7,500-£8,500

This will interest analysts with upwards of two years' solid experience of commercial and accounting systems, ideally including some financial inodelling.

(Ref. 329CW)

PROGRAMMER:

£6,500-£7,500 The requirement is for at least two years' COBOL, on any hardware, ideally including mainframe on-line applications. (Ref. 330CW)

Working conditions are first-class (purpose built computer centre), and career prospects in a successful, thriving organisation are good. There are valuable fringe benefits, and in certain circumstances generous relocation expenses will be offered.

Please ving us in confidence for an initial talk, quoting the appropriate veletience, or leave a message on our abstoering machine after hours and well.



Programmers Up to £6640

Appropriate the content of the conte

If you have at least 18 months' experience in writing COBOL programs there is a variety of openings to join the Management Services Department of W. H. Smith & Son Limited which is based at Swindon.

Experience on tCL mainframes both 1900 and 2900 would be an advantage as would some practical use of BASIC but now of these are essential. There are good promotion prospen for the right people and the flexibility to gin experience on both mainframe and minicomputers.

Starting salary will be up to £6640 (cost of living review due April 1) plus the normal range of large company benefits including a non-contributory pension scheme and discounts on a substantial range of company

Please telephone Swindon (0793) 36271 – extension 325 – for an application form or write to: The Personnel Officer, W. H. Smith & Son Ltd., Greenbridge Road, Swindon,

W. H. SMITH

SENIOR PROJECT MANAGER/LEADER **AND**

SYSTEMS ANALYST required with extensive experience in the

eign end inetalistion of real-time direct in entry bueiness minicomputer systems with high level lenguegea.

Previous employment of aultable applications should have been melnly with a supplier. business systems.

Minnie ere computer aystem auppliers instelletions in City finencial establishment and general commercial companies and its offices in E.C.1 and E.C.2. Salary range: 11,000.

Telephone or write to

Miss K. Marsden
MINNIE BUSINESS SYSTEMS LIMITE
21 Dingley Road, London, EC.1 01-251 4529

-Brospa Data Ltd-

PERIPHERAL SALESMEN and SUPPORT ENGINEERS

This emeil but expanding company me computer peripherals needs to eppoint

- computer engineers to install and m

Brospa Data is an associate of a later established Reading company and Interesting opportunities for advanced the company grows.

We believe these posts would suit so under 30 and have in mind base salaries 18,000-£10,000 range. If these vacation to you, please write or telephone Spanner.

EUCARTER ST. WEADING BERNS

CONSULTANTS! London Based

Computer Consults

NORTH SURREY DELIGHTFUL LOCATION

SYSTEMS ANALYSTS - TEAM LEADERS

SALARY £11,500

Advanced mainframe and distributed processing systems are being developed by our Clients using an IBM 4341 mainframe, System 34 minis and APPLE micros to meet a variety of accounting and manufacturing systems.

Vacancies exist in both mainframe and distributed processing teams for candidates over 25-yeara-old with initiative, drive and experience in the development of on-line systems. Three years' proven analysis experience with an additional background of RPG II or COBOL programming on IBM equipment is required and preferably a degree or HNC.

The Client offers "atate of the art" systems, career development opportunities, together with regular reviews and spacious offices which are set in rural surroundings. Relocation package may be offered plus many other benefits.

Should you be interested, please contact ROY HIGHFIELD, ADVISING CONSULTANT and confidential interviews can be arranged. Rcf. CWO

HUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE, HUTTON STREET, LONDON EC4Y BMP.

TELEPHONE: 01-353 7141 (24 HOURS)

WORD PROCESSING SALES PROFESSIONALS

CENTRAL LONDON £16,000-£18,000 UP FRONT TWO-LITRE COMPANY CAR

If you have had at least two successful years with one of the handful of prestigious Word Processing Companies in the U.K. today, then we would like to meet you.

We want the opportunity to discuss a future with our Clients, an American market leader in stand-alone and shared resource Word Processing Systems.

They are prepared to 'front' a good income with excellent potential to earn substantially more selling a comprehensive range of firstclass W.P. Systems

Contact BOB BOWER, ADVISING DIRECTOR, quoting reference CWO502/4.

MUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE, HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

A NEW CHALLENGE IN 1981

PERMANENT SENIOR SYSTEMS ANALYST: IBM based with some

DB/DC experience

TRAFALGAR HOUSE

8-10 NELSON ST.

ESSEX

SOUTHEND-ON-SEA

SYSTEMS ANALYST: IBM based

SENIOR SYSTEMS PROGRAMMER: IBM/MVS Essex

SYSTEMS PROJECT LEADER: ICL

SENIOR DATABASE DESIGNER

SENIOR DATABASE PROGRAMMER: Assembler/CECS

SENIOR PROGRAMMER: PL1 preferably with CICS

PROGRAMMER: PL1/CICS minimum 2 years exp. £7.400

SYSTEMS PROGRAMMER: Knowledge of VIAM CHIS London

IBM SYSTEMS 34: Programmer Analyst London

SENIOR PROGRAMMER: Honeywell 1..66

SENIOR DATARASE ADMINISTRATOR: Honeywell £10.000

For further information contact. Daphne Roadnight

CONTRACTS

COBOL MVS/VFAM PROGRAMMER

DOS/VSE SYSTEMS PROGRAMMER MVS SYSTEMS PROGRAMMER

COBOLIMS PROGRAMMER

San Francisco CICS or SHADOW PROGRAMMERS Boston & Dallas

For further infarmation contact. Peter Recyc

Rendeck

SOUTHEND (9702) 333555

North West

Holland

Holland

OFFICES ALSO IN AMSTERDAM, DUBLIN, BOSTON, SAN FRANCISCO AND DALLAS





SUSSEX/SURREY BORDER

MANAGEMENT SERVICES MANAGER C. £13,500 P.A. + CAR + FRINGE BENEFITS

ADVANCED ON-LINE PRODUCTION SYSTEMS NEW MAINFRAME DUE FOR DELIVERY SUMMER 1981

Our clients, one of the world leaders in their field, are engaged in the design, manufacture and distribution of accessories and components used in the Electronics, Telecommunications, Aerospace and Electricity Supply Industries. They are enjoying substantial growth having achieved a turnover of more than £14 million in 1980, with a forecasted turnover in 1981 of £20 million.

They wish to appoint a person to fill the above role, reporting direct to the Board, who will be responsible for developing and implementing the Company's D.P. Plans for the future. If your background and experience are commensurate with the following requirements, telephone or write to us now to arrange an early interview in London or the South:

- Proven management ability gained from heading up a medium-sized D.P. Installation.
- Sound Systems Development experience associated with the design and implementation of complex on-line systems within a Production
- Self motivated, with the ability to motivate staff and relate well with all levels of user management.
- An Engineering related Degree is desirable, or alternatively, a high level of academic achievement will be expected.

INBUCON MANAGEMENT CONSULTANTS LIMITED

D. P. Appointments & Contract Personnel. Greenock House, 19 Cuckfield Road, Hurstpierpoint issex BN6 9RP, Telephone: Hurstpierpoint (0273) 833848

ANALYST/PROGRAMMERS

£8,500-£11,500 p.a. RELOCATION PACKAGE AVAILABLE TO SWINDON

This major corporation is setting up a brand new Europeen Data Centre based on en IBM 4331 network using CICS, TSO, VS. The depertment's offices and computer room are literally being built et this moment. The development plan hes been egreed we now wish to recruit three rather special analyst/progremmers; people with the resilience and personality to attein a high level. achievement and professionalism in their work, despite any teething problems that mey occur.

The d.p. department reflects the company's dynamic, modern approach to management, giving members en opportunity in press their thoughts and eccept responsibilities commensurate with their eblitties. The company manufectures very high technic logy products and its growth over the lest decade has been one of the talking points of Wall Street. Now it is e multi-million corporation whose profits enable it to pey top industry selarles. Corporete personnel policies have developed a company where average ege is lower, and the average intelligence is higher then normal. The management is results oriented and the company driving forward from success to success.

These posts represent a real opportunity to gain excellent experience in a modern IBM on-line and database installations department is still in its embryonic stage, consequently those capable of making a substantial practical contribution roll. in future, enjoy considerably increased saleries and responsibilities. Projects will be technically stimulating giving

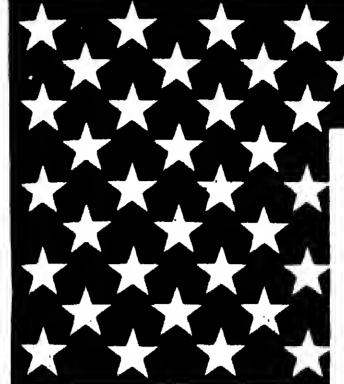
Satisfaction.

**CUALIFICATIONS: The only mandatory requirements are e-minimum of 4 years, IBM COBOL programming and some exposurancy shall be better. However, to be successful you must have the personal that ignores lob demarcation and instinctively tackles any task necessary to achieve the end result. Intelligence and good munications ability are taken as read. A good relocation package is available.

To join a first-class department, datain an increase in salary and enjoy the quality of life associated with living in the West Council.

RING DAVID J HUTCHINSON ON 01-828 7956

nuchia a - scooias 10 Wilfred Street, London SW1E 6PL. Telephone: 01-828-7956



A NEW CHALLENGE

No doubt you have heard that before, but with Lambda we are confident you will find the challenge of working in America on a variety of projects for our Clients, both exciting and absorbing. Lambda has become one of America's foremost consultancies, operating from seven offices throughout the United States, with a staff of over seven hundred. As part of this continued expansion, our London office recruits staff foremployment in America for a minimum term of one year.

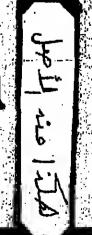
If you have two years, COBOL, PL1 or ASSEMBLER plus some IBM experience then we can offer in addition to a very competitive salary, full return airfare, relocation expenses, free medical and dental insurance and provision of the appropriate visa.

So, if you would like to meet the challenge of playing a role in the continued growth and development of the American Computer Industry, now is the time to explore the opportunities.

Call Bill Baker



Lambda Technology Inc: 25 Manchester Square, London W1 Tel: 01-486 2101



even to catch whoever it is

keeps 'pluning his auotie is

Brisbane every other lunch-

One thing is certain. It

Identifying these individuel

truth can be perceived in little

Motivations

selling practice.

Here are some of the moti

vational forces that reside

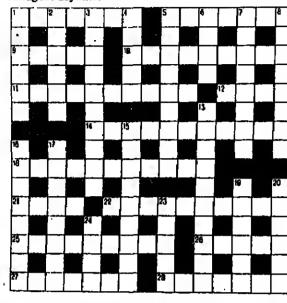
within the selling arena: sus-

more than innuendo.

[CW Prize Crossword 13]

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The secund and third solutions opened will receive £5 each. Entries to Crossword Competitios, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, by first post Friday, February 13. Please use a bellpuint to complete the crossword, and isclude a telephone sumber at which you can be reached during the destine.



l accept the rules and conditions of the Computer Weekly Crossword Competition.

years (6) Covered with sticky stuff

the dope upset over me,

an old copper (6)
Blimey, the doctor, king and workers are gluttons

authority' about to get

suspended (9)
Girl's turned up for feast

Large-scale disease

makes one heroic - me, l'd collapse inside (8)

Region having power

that's easily managed (9) One who fixes tax makes

fools andlessly irritable

Glasses are no comfort,

initially, among uo-

1. Mother gets soldier al-most quiet, cousing you up-to-date, if taking 5. Take clothes off washer- 2.

woman, parting with a note (7) 9. Object that's not quite 4. Only Richard will include

modest (5) 10. Once tried out, it's abstruse (9)

Achievement, we hear, of this song (5) former-great boxer. 5. Without reform, world reveals basic weakness (4,2,4) 12. Bird you've to capture in

retreet? Thet's about right (4) 14. A disgrace, writing it backwards — it affects the eye (11)

13. Refuse entry to the Ger-man, sick with love for a buil-fighter (10)

nalist with only a skeleton staff? (5-6)

21. Love's tender back (4)

22. Prepared for action there's a race here before 15. day breaks (2,3,5)

25. A snug type of car used 16. by advocates generally (6-3)

26 Catch a girl with e ring 17 27. Refresh the others with

th derground workers (8)

19. Member of eastern race having standard look (6)

20. Try, for a change, a certain Histocounty (6)

231 Hello. — a Communication

23 Hello - a Commu-taken on the staff? (5) 24. A game explorer (4) RULES AND CONDITIONS

1. Each competitor may issue three weeks after the puzzle has been published.

12. The competition is open to 4. Winners will receive their will readers of Compoter Weekly with the exception of the sanff of IPC hasiness Press Litd, any printers comployed by them on the near relatives of any any sulface of the relative will pushed by them on the interpretation of the relative will pushed by them on the interpretation of the relative will pushed. The entire of the relative will pushed by them on the interpretation of the relative will pushed by the entire of the relative will pushed by the competition.

COMPUTER FIELD ENGINEERS

Mini or Mainfrante acc.

Vacancies exist in Southampton and London with top international Co. Applicants must be under 30 with INC or equivalent.

Exc. Sal. + Bonus | S./B. + C/T and 3, car.

There are other vacancies in Savencetes, Crydon, Swindon Newbury, Horsham, Watton, Leitoster, and London.

Sele. to ERK + S/B + C/T and our (Depletifying on location and quals.)

Gelf, David Attwell, days 01.384 4477; Eynes, River 1748

or write: Detawell, Computer Error. Sept. Ltd., 10 personnel.

Computer Supervisor

THE COMPANY

Aberdeen Bervice Company (North Seel Limited is one of the major general service companies involved in the North See Cillindustry. Its operations encompass the purpose-built South Bay Marine Base at Patenheed, Engineering facilities at Patenheed; the provision of specialist personnel for Offshore Patiners Maintenance; Transport; Property; and the supply of Gender Goods to the Offshore Industry.

The computer supervisor will be responsible for controlling the day-to-day operations and supervising the computer staff. Other duties will include scheduling wort; itsison with user departments; identifying/reporting bardwars/software faults; and providing holiday and sick leave cover.

APPLICANTS Applicame should have a good general education with at least two years' relevant commercial computing experience.

Salery and banefite will be commensurate with qualifications and experience. There is a contributory pension achieves and free Rise assurance. Applications should be made, in writing Mr. W. N. Guy, Benlor Financiel Manager, Aberdean Bervico Compan

(North See) Ltd., Guild Bess. 28 Guild Street. Aberdsen A6t 2NJ

POLYTECHNIC OF THE SOUTH BANK Department of Mathematical Sciences and Computing

PRINCIPAL LECTURER IN COMPUTING

LECTURER II/SENIOR LECTURER IN COMPUTING

AND TEMPORARY LECTURER II IN COMPUTING

A Principal Lecturer la required for April, 1881, and é Lecturer II/Senior Lecturer for September, 1981, to teach Computing in the Department of Mathematical Sciences and Computing. This is a lively department, able to offer excellent career opportunities in most areas of the authentical in the provides of the subject. It provides of range of professioner Computer Studies courses at both undergraduate and postgraduate levels, and is gurrently expending into Computer Education. It is strongly especially with the Microcomputer Advisory Centre for the Polytechnic.

The Principal Lecturer is required in order to easist in course development end encourage research and consultancy work. A higher degree in Computing is desirable together with research and teaching ability and edministrative experience in education and/or industry. The post is available to apecialists in althar Computer Science or Data Processing

hat ecturer II/Senior Lecturer is required to teach on and sealer in the administration of the department's courses.

Cendidates should possess a degrae in Computing and a subject specialism which includes Programming. Teaching experience is dealrable but not essential.

he Temporary Lacturer | je required as econ as possible, he sepondiniment | terminating on August 31, 1981. The Majarpointment | terminating on August 31, 1981. The Majarpointment | terminating on August 31, 1981. The Majarpointment to the Microcomputer Advisory affire Califidates should possess a degree in Computing and a subject apacialism which includes Programming and a subject apacialism which includes Programming. Teaching experience is destrable but not essential.

Principal Legiturer is 500 £10,509 £13,248
Sential Legiturer £8,952,£10,539
Legiturer £8,012,799,702
Plus £759 [London Allowance]

Application form and further particulars available from Staffing Office, Polytechnic of the Spath Bank, Borough Road, Longon, SE , OAX | Tel. 81-815 6969 Ent. 2023 | S. Closing date for the receipt of functions applications

ANALYST PROGRAMMERS

Oxy circle the world on oil related projects of many kinds. North See Oil developments are an important part of our universe and wo have a demond for exper-

lenced professionals.
We now wish to recruit additional
Analyst/Programmers to specialise in business systems development.
As an Integral part of a small team, you will play a major rele in initiating and implementing business systems in liaison with the appropriate user depertments. Initially, approximate and limiting and systems.

program development and imple mentation will be your prime mentation will be your prime function. Having gained experience, this may alse be expanded to include a leadership position in the feasibility study and detail design of interactive data base systems. These positions will suit ambitious young graduates with a minimum

of two years' experience in business systems programming. A thorough knowledge of COBOLIS essential. Experience with medium te large scale IBM equipment, IMS, CICS-DLL and materials management or financial systems is desirable.

Systems is desirable.
Oxy rewards reflect the progressive approach of a world leader, with appreciated, top salaries, for weeks annual holidays, contrib tory pension scheme, free ti

> G. G. Fowle Personnel Officer
> Occidental Petroleum (Caledonia) Ltd 127 Causewayend



Progress around the world



Technical Support Staff

Although wour SEGAS are already minning the largest CIC'S notwork In the UK, we ore still in the development place. This means an increasing worklood local Tachnical Support Groups which is why wa are looking for more people utalities in We have a number of excellent apportunities for experienced people, also for irolness wanting a new career in Systems Programming in the following areas.

leleprocessing We have approncising 1,000 forminals using ACF/VIAM, CICS/VS and ACF/NCP.
Distributed processing systems are being implemented using 8100 and 3680

We have a challenging opportunity for an experienced MVS/JES2 Systems Programmer who wishes to brooden his/hor experience with a widerenge of products—such as TSO, ROSCOF, VM/CMS etc., which control our IBM 3032 and

Parformance Measurement and Capacity Planning
To contribute to this work you will need experience of Hardware related to stanger performance monitoring in an environment similar to our own. A range of Parformance monitoring tools is in use including TESDATA, MS88 hordware monitoring will be given where appropriate.

A pilot dotobase is being set up using DL1 and there is a great apparatify for someone with experience of IMS/VS/OB. Associated products in use are DATAMANAGER and DB PROTOTYPE.

Job Benefits Include: good working conditions, generous holidays, sick pay, pension and insurance schemes, sports and social inclinies, relocation assistance

for lurther details please ring John Holmes, Technical Support Manager of 01-688 4466 Ext. 6005 or, offer 7 p.m., Shorptharns (0342) 810054, or write. qualing rel. 0.6714/CW, to: Personnel Manager, South Eastern Gas, Segas House, Kalharine Streel, Croydon, Surrey CR9 1.1U.

SOUTH EASTERN GAS

GLASSIFIE

DIRECT LINE 01-661 012

the newspaper computer people told

Analyst/Programmer IBM 4331, VM/CMS

C. £7K

Rural Kent

Proprietary Perfumes (International) Ltd. is a leading international perfumery house supplying fragrances for use in a multitude of fast-moving consumer goods.

The recent installation of our own IBM 4331 means that we need to resource our expanding another development by adding to our small team of professionals.

We seek a person capable of independent action to be reaponable for systems davelopment from analysis to implementation. Ideally, you will be mid-twenties with, gay, two years' experience and knowledge of PL1. Essentially, you will have the ability and potential to grow within the

Wa offer a competitive benefits package including generoua relocation assistance and flexible working hours.

Placae write or call: Bill Broadbridge, Proprietary Perfumes (International) Ltd., Ashford, Kent TN24 OLT. Tel: (0233)

P.S. The present configuration is 4331 (1MB), using VSAM and VM/370, with 2 x 3370 disks, 2 x 8809 tapes, 3282 printer, 20 x 327X VDUs with further



DISTRIBUTED SYSTEMS LIMITED

ANALYST/PROG. Attractive opportunity for self-slerter with cound commercial systems exp. and fluent COBOL or BASIC. For small expanding OEM. Cantral London. PROGRAMMERS. Financial information service + 2 years' exp. BAL or PL/t. City.

SYSTEMS ANALYSTS. For Banking Systems development, 2-4 years' axp. BASIC essential, DEC and Banking exp. decirable. £7,000-£8,600. Central Lon-

PROJECT LEADER. For customar technical support. 4-5 yeers' BASIC essential. DEC and Banking exp. destrebie. £8,000-£9,500. Central London Ref. 8)/22 ASST. O.P.M. Exp. Analyst/Prog. with Benking exp. £10,000-£10,500. City. Ref. 31/23 OPS SUPVR. Exp. Senior Op. with supervisory axp. S/34 or DEC. City. Reliai/24

SYSTEMS PROG. IBM Airline Control Program. exp. 3-9 months. London.



Licensed in accordance with Employment Ageocles Act 1973 SE(6)

70 Borough High Street, London SE1 1XF Tel: 01-403 3456 1568 24-Hour Answerphone [2584]

SYSTEMS PROGRAMMERS £9,000

A leading finencial concern has outstanding career opportunities for experienced systems support in their data centre attested in Kent's Madway area. These positions offer expellents excellent opportunities to work with the following inhouse systems: VM/CMS, OS/VS1, DOS/VS, CICS/VS, IOMS, currently running on IBM 370/148 and 3031 herdware. Candidates must possess a solid grounding on CS/VS1 preferably backed by a working knowledge of VM, BAL, CICS and database systems. The company offers excellent selected, comprehensive company benefits including an excellent relocation package and a convenient and pleasant working environment.

PRINCIPAL ENGINEERING SYSTEMS ANALYST £11,000+

A challenging opportunity has arisen within a leading American engineering company based west of London: The principal functions of the position are to initiate and direct activities pertinent to the development, maintenence and support of technical and selentific computer systems used throughout the company in technical enalysis and design; to meintain and, where possible, enhance the sompeny a competitive position with regard to engineering technology. Candidates must possess a BSp in angineering or edence with 6-12 years, total experience or 4-6 years as an Engineering Analyst. Excellent relocation le offered where appropriate

TECHNICAL SUPPORT ANALYST £8,500

This position, has been created by the above mentioned engineering company to support the provision of interscrive computer services and mini-computer based applications to a high level of reliability. Applicants must possese a minimum of 3 years. De experience including an understanding of intersolive systems. In addition he/she must be prepared to keep abreast of softwere/hardware in current use and to provide user training and maintenance of standard/user guides. A working knowledge of APL would, he a distinct advantage. Excellent religiousline is offered where appropriate

KEY OPERATIONS ASSISTANCE LIMITED 27 NOEL STREET, LONDON W1 01-439 7551

SALES **EXECUTIVES**

Just in case you think we are merely the industry's leading supplier of career guidance for salesmen (to say nothing of sales training and market research!), we are currently recruiting candidates for over 100 selling jobs within more than 30 computer companies.

If you are seeking a career rather than just a selling job, contact Alasdair Scott or Alan Williams -- we have the experience to understand your needs.

Tel:01-734 9776

NORTH YORKSHIRE COUNTY COUNCIL

Senior Assistant County Treasurer

Head of **Computer Services**

£14,288-£15,177 (from 1st April, 1981)

Applicants should be computer enthusiests with experience of the administration of a major computer instellation. With a current stelf of 74, the auccessful applicant will be responsible to the County Treasurer for managing the authority's ICL 2976 and 2879 systems operating under VME/8; providing a comprehensive computer service to all departments of the County Council, saveral District Councils and other bureau users; and developing advanced computer systems.

Apply, giving full personal details, summery of previous axperience and names of two referees, to County Treasurer, County Hell, Northellerton DL7 aAL [tel, Northellerton 10609) 3123 Extension 4091, CLOSING DATE 21ST FEBRUARY, 1981.

Senior Programmer

£8,538-£9,471 p.a. incl.

We are seeking a Sanior Programmer to head a team of four programmers who will be an experienced ICL COBOL programmer with at least one of the following languagae: PLAN, T.P.L., or C.O.E. and be ekilled in structured programming. The Authority has invested heavily in Computer Resources and is responsible elso for providing a service to the neighbouring Sotoughs. of Surrey Heath and Runnymede.

The Council's computer configuration comprises en ICL 2904 installation with 84K, ED\$60's, trein printer. 15Qt CDE date entry and on line enquilry from 4 video Terminels. The installation has recently been enhanced with on-line feclittles [MINIMAC] and an extensive Cash Receipting natwork

TEMPORARY HOUSING will be available in approved cases along with generous removel and disturbance ellowances togeth ar with legal face on house purchase up to £1,500.

Please contact the Chief Personnel Officer, Goungil Offices, Woking, Sufrey (Tell STD 04882 5931 Extra. 17) for application form and job description. Closing dele: 17th February, 1981.



BOX NUMBERS Box number replies should be addressed to

pte Computer Weelfly
Derset House
Stemlard Street
Liendon SE1 9LU

THE SALES BIT

Hard or soft, selling is an emotive issue

I.AST week, I presented some thoughts on why people buy and the difference between the product they buy and the need or desire they are the prospective buyer react positively at the stage, it may well be that his prime motivation is the desire to feed his inherent oregaloere consciously or sub- mar cunscinusly wishing to satisfy. However, further question This week, I would like to present a different espect of the some situation; that is, escalating telephone costs, or

same reasons' Inasmuch es the permuta-tiun of individuels and their particular situations is infiparticular situations is infinite, the chances of two people in similar circuinstances hoving the same mutivational forces ere very re- faster thes the competition

Penple do not necessarily

People cannot be arbitrarily motivotions demands eategorised in terms of what is likely to turn them on or off end to assume is generally tu

be mistaken. que, sensitivity, perceptioo

It is essentiel, therefore, and the ability to listen, as that salespeople develop the opposed to hear. Frequently skill to identify these enution truth can be perceived in little nal factors quickly, for with-out this level of under-standing it is impossible to present the reasons for pur-chase that the buyer wishes to

You mey think all this sounds ohvious, We ell know There is no point in putting one buys an umbrelle to keep off the rein, rather then for forword economy as the maio reason for buying a particular the thrill of owning a fabriccar if the potential client is looking for a symbol of his senior status.

covered, collapsible metal frame with a handle. This On the other hand, the transportation manager for the same company might see economy as the only significant seems. It is a fractional than common sense, is often overlooked in selling practice.

cant consideration. One man's meat is another man's

tenance, enxiety, security, prestige, comfort, affection, sex, health, curiosity, politics, taste, ioertia, pride, avance, Megalomania? For Instance, the salesman may describe the telephone monitoring system he is selling as capable of giving complete management control of individual telephone usage by providing details of all ioning and outgoing calls for decision. coming and outgoing calls for every extension in the bulld-

TRADER

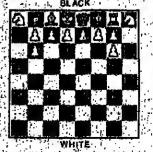
CONFERENCES

Electronic mail takes off

BLECTRONIC mail is about to take off in Europe. Results of suddles made by the PTTs (Germany's KTK, Swedon's Office 85, France's Nors-Mine CCITT, and CEPT Study Group) are now emerging through a series of anouncements which indicated the imminent laufieh of electronic mall on a targe scale. The third annual Symposium on Electronic Mail and Messaging goes into the subject in detail and provides a technology update. Organised by the Yankeo Group; it will be held from March 23-24 st the Cumberland Hotel, London, Further infrom Merch 28-24 at the Cumber-land Hotel, London, Further in rais, it will be held from March 30-April 1 at the Institute of Education, Regal House, Liswer Richmond Road, Chorleywood, Rickmansworth, Herta, Tel: members, Details from McC (092781 4714.

Physical Artist of Conferences, Surrey House, Throwley Wey, Suiton, Surrey. Tel: 01-43 8040.

BLACK



THE middle four pieces on the nighth rank are in-

SELLERS of computer systems, word, processing systems, periphorals packaged software and media and supplies are expected to come together at Condex 81, to be held in the Convention Centre in Nevada, Las Vegas. Exhibitors last year included Apple Computer Inc. Control Data, Honeywell Information Systems and Zilog. The exhibition, to be held from Novambor 19-24, will feature soliciduled from conferencies; and the option of direct mail follow up siter the thow. For further information conferencies: The Inferface Group, 60 Speep Street, Framlaghain, Massachusetts 01/01 USA. SELLERS of computer systems

Hard or soft,

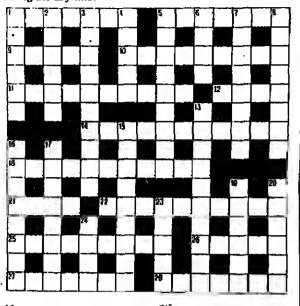
selling is an

THE SALES BIT

(CW Prize Crossword 13)

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Suttoo, Surrey SM2 5AS, by first pust Friday, February 13. Please use a hellpuint to complete the crossword, and include a telephoee number at which you can be reached



DOWN

the dope upset over me,

an old copper (6)
Blimey, the doctor, king

and workers are glutions

authority ebout to get

Large-scele discese.

makes one heroic - me, I'd collapse inside (8) 8. They're prominent in

(8) ... Glasses are no comfort.

taken on the staff? (5) 24. A game explorer (4)

er — in backs (8)

13. Refuse entry to the Ger-man, sick with love for e buil-fighter (10)

(10)
4. Only Richard will include

I accept the rules end conditions of the Computer Weekly Crossword Competition.

ACROSS

- 1. Mother gets saldier el-most quiet, causing you up-to-dete, if taking
- wonder (7) years (6)
 5. Take clothes off washer- 2. Covered with sticky stuff
- 9. Object that's not quite 3 modest (5) 10. Once tried out, it's ebs-
- Achievement, we hear, of former great boxer 5. Without reform, world, 11. Achievement, we hear, of
- (4,2,4)

 12. Bird you've to capture in 6. Girl's turned up for feast retreet? That's shout (4)
- 14. A disgrace, writing it backwards it sifeels
- the eye (11) 18. Swift writing by top jour-nalist with only a skeleton
- Love's tender back (4)
- litere's a race here before 15. Region having power day breaks (2,3,5) that's easily menaged (9)

 25. A snug type of car used 16. One who fixes tax makes by advocates generally (6- fools codlessly irritable
- 26. Catch a girl with e ring 17.
- initially, among un-derground workers (8) 19. Member of eastern race mineral (7) lee does melt — see? (7) having standard look (6) 20. Try, for e cheuge, a cer-min Irish county (6)

I: Each competion may littue three weeks after the puzzis submit no more than one entry.

2. The competition its open to all readers of Computer Weekly with the exception of the saft of IPC Business Press Lind, say printers employed by them or the nest relatives, of any such staff, and be decision to the one relatives, of any such staff, and be fined on all matters will normally be published in the will be antered into.

COMPUTER FIELD

Min) or Mainfraga, exp.

Vacancias salist in Southempton and London with top lobernational Completes against in Southempton and London with the loss of the souther south the loss of the south the loss of the south th

Computer Supervisor

Abardoen Service Company (North Seel Umited is one of the major general service companies involved in the North See Od Industry. Its operations encompass the purpose-bull South Bay Majina Base at Paterhead: Engineering Isolitizes at Paterhead: the provision of specialist personnel for Citizhore Platform Majintenance; Timingori; Property; and the supply of Bonded Goods to the Citizhote Industry.

The computer supervisor will be responsible for controlling the day-to-day operations and supervising the competer staff. Other cludes will include scheduling work; Illeisen with user dopartrannis; identifying/reporting herdwart/software

Applicants should have a good general education with at issue live years' relevant commercial computing experience.

Salery and benefits will be commensurate with qualifications and seperience. There is a contributory pension scheme and free Ilia assurance. Applications should be made, in writing

POLYTECHNIC OF THE SOUTH BANK

Department of Mathematical Sciences and Computing

PRINCIPAL LECTURER

IN COMPUTING

LECTURER II/SENIOR LECTURER

IN COMPUTING

AND TEMPORARY LECTURER II

IN COMPUTING

A Principal Lecturer la required for April, 1981, end e Lecturer il/Senior Lecturer for Saptember, 1981, to teach Computing in the Department of Melhemetical Solances and Computing. This is a lively department, able to offer excellent oarear opportunitias in most areas of the subject. It provides a renge of professional Computer Studies courses at both undergreduate and postgreduate levele, and is currently expending into Computer Education. It is strongly associated with the Microcomputer Advisory Centre for the Polytechnic.

The Principal Lecturer is required in order to seelet course development end encourage research and coneultancy work. A higher degree in Computing is desirable together with research and teaching ability and administrative axperience in education and/or industry. The post

Candidates should possess a degree in Computing sho e subject specialism which includes Programming. Teach-ing experience is deal(able but not essential;

The Tempolity Lecture II is required as addr as possible, the Tempolity Lecture II is required as addr as possible, the appointment terminating on August 31, 1981. The position would involve teaching Computing and possibly a small commitment to the Micropomputer Advisory Centre: Candidates should possess a degree in Computing and a subject specialism which includes Programming. Teaching experience is desirable but not essential.

Application form and further particulars available from: Staffing Office, Polytechnic of the South Bank, Borough Road, Lendon SE GAA (Fe): 91-925, 5985, Erd. 2023).

Closing date for the receipt of crimpisted applications. Papillary 29: 1981

ANALYST PROGRAMMERS

Oxy circle the world on all related projects of many kinds. North Sea Oil developments are an important part of our universe and we have a continuing demand for exper-

lenged professionals. We now wish to recruit additional Analyst/Programmers to special-ise in business systems development:

As an integral part of a small team, you will play a major role in initiating and implementing business systems in Ilaison with the appropriate user departments. Initially program development and imple program development and imple-mentation will be your prime function. Having gained exper-ience, this may also be expanded to include a leadership position in the feasibility study and detail design of interactive data base systems. These positions will suit ambitlous

of two years' experience in bus

approach of a world leader, with

G. G. Fowle



Progress around the world



Technical Support Staff

Although we of SEGAS are objected from the largest CICS not work in the UK, we are still in the development phase. This means an increasing workload for our Technical Support Group – which is why we or a looking for more propie of allevels. We have a number of excellent apportunities for experienced people, also fer trainess worting a new career in Systems Programming, in the following areas.

We have approaching 1,000 terminals using ACF/VTAM, CICS/VS and ACF/I-ICP.
Distributed processing systems are boing implemented using 8100 and 3680

We have a challenging opportunity for an experienced MVS/JES 2 Systems
Programmer who wishes to broaden his/her experience with a wide range of
products – such as TSO, ROSCOE, VM/CMS alc., which control our IBM 3032 and

Performance Measurement and Copacity Planning
To contribute to this work you will need experience at Hordware related to sizing or performance monitoring in an environment similar to our own. A range of Performance monitoring looks is in use including TESDATA, MS88 hardware monitoring froining will be given whare oppropriote.

A pilot dotabase it being set up using DLI and there is a great apportunity for someone with experience of IMS/VS/DB. Associated products in use are DATAMANAGER and DB PROTOTYPE. Job Benefits Include: good working conditions; genorous holidays; sick pays:

pension and insurance schemes, sports and social facilities, relocation assis provided in oppropriate cases. rortuther details please ring John Holmes, Technical Support Monoger on Oix688 4466 Ext. 6005 or, ofter 7 p.m.; Sharpihame (0342) Bi0054, or write,

quoting rel. 0.6714/CW, to: Personnel Manager, South Eostern Gos, Segas House, Katharine Street, Croydon, Surrey CR9 11U,

SOUTH EASTERN GAS

GLASSIFIED

DIRECT LINE 01-661 012

the newspaper computer people tell of

Analyst/Programmer IBM 4331, VM/CMS

C. £7K

Proprietery Perfumes (Internetional) Ltd. is a leading internetional perfumery house supplying fragrances for use in a nultitude of faat-moving consumer goods.

The recent instelletion of our own IBM 4331 meens thet we need to resource our expanding aoftware development by adding to our smell teem of professionals.

We seek a person capable of independent action to be responsible for ayatema development from analysis to implementation. Ideally, you will be mid-twentles with, sey, two yeers' experience end knowledge of PL1. Essentially, you will heve the ebility end potential to grow within the

We offer a competitive benefits peckege including generous relocation easistance and flexible working hours.

Please write or cell: BIII Broedbridge, Proprietery Perfumes (Internetional) Ltd., Ashford, Kent TN24 0LT. Tei: (0233)

P.S. The present configuration is 4331 (1MB), using VSAM end VM/370, with 2 x 3370 disks, 2 x 8809 tepes, 3262 printer, 20 x 327X VDUs with further expension for a seen.



DISTRIBUTED SYSTEMS LIMITED

PERMANENT

ANALYST/PROG. Attractive opportunity for self-slarter with sound commercial systems exp. and fluent COBOL or BASIC. For small expending DEM. Central London. PROGRAMMERS. Finencial information service + 2 years' exp. BAL or PL/1. City.

SYSTEMS ANALYSTS. For Banking Systems development. 2-4 years' exp. BASIC easentiel. DEC and Benking exp. dealreble. £7,000-£8,500. Central Land. PROJECT LEADER. For customer technical support. 4-5 years' BASIC sessential. DEC and 6 enking axp. dealrable. £8,000-£9,500. Cantral London Rei. 21/22

ASST. D.P.M. Exp. Anelyat/Prog. with Benking exp. £10,000-£10,500. City: DPS SUPVR. Exp. Senior Op. with supervisory exp. S/34 or DEC. City. Ref. 81/24

SYSTEMS PROG. IBM Airline Control Program. exp. 3-6 months. London.



Licensed in accordance with Employment Agencies Act 1973 SE(B)

70 Borough High Street, London SE1 1XF
Tel: 01-403 3456 156B 24-Hour Answerphana 12384t

SYSTEMS PROGRAMMERS £9,000

A leading finencial concern has outstending career opportunities for experienced systems programmers to provide additional systems support in their data centre situated in Kent's Medwey cree. These positions offer epplicants excellent opportunities to work with the following inhouse systems: VM/CMS, OS/VS1, DOS/VS, CICS/VS, IDMS, currently, running on IBM 370/148 and 3031 herdware/ Candidates must possess a solid grounding on CS/VS1 preferably backed by a working knowledge of VM, BAL, CICS and database systems. The company offers excellent estarles, comprehensive company benefits including an excellent relocation package and a convenient and pleasant working environment.

PRINCIPAL ENGINEERING SYSTEMS ANALYST £11,000+

A challenging opportunity has arisen within a leading American angineering company based west of London. The principal functions of the position are to inlite and direct activities pertinant to the development, meinteners and support of technical and scientific computer systems used throughout the company in technical analysis and design; to maintain and, where possible, annance the company's compatitive position with regerd to engineering technology. Candidates must possess a BSc in angineering or science with 8-12 years; total experience br.4-6 years as an Engineering Analyst. Excellent relocation is offered where appropriets

TECHNICAL SUPPORT ANALYST £8,500

This position has been created by the above-mentioned engineering company to support the provision of interactive, computer earlies and mini-computer based shilling to a 'tigh level of rellability, Applicants must possess a minimum of 3 years 'DP' experience individing an understanding of interactive systems. In addition ha/she must be prepared to keep abreast of software/herdware in ourrent use and to provide user training and mentenance of standard/user goldes. A working knowledge of APL would be a distinct advantage. Excallent religation is offered where appropriate.

KEY OPERATIONS ASSISTANCE LIMITED 27 NOEL STREET, LONDON W1 01-439 7561

SALES EXECUTIVES

Just in case you think we are merely the industry's leading supplier of career guidance for salesmen (to say nothing of sales training and market research!), we are currently recruiting candidates for over 100 selling jobs within more **th**an 30 computer companies.

If you are seeking a career rather than just a selling job, contact Alasdair Scott or Alan Williams -- we have the experience to understand your needs.

Tel:01-734 9776

NORTH YORKSHIRE COUNTY COUNCIL

4900000000000000

Senior Assistant County Treasurer Head of

£14,286-£15,177 (from 1at April, 1981)

Computer Services

Applicents should be computer enthusiasts with exparience of the edministration of a major computer installation. With a current steff of 74, the successful applicent will be responsible to the County Tressurer for managing the euthority's ICL 2976 and 2970 systems operating under VME/B; providing a comprehensive computer service to all departments of the County Council, several District Councils and other burses users; and developing advenced computer systems;

Apply, giving luli personal detelle, summery of previous axparience and names of two referees, to County Tree-aurar, County Hell, Northallerton DL7 6AL (let, Northellerton (0609) 3123 Extension 406). CLOSING DATE 21ST FE6RUARY, 1661.

Senior Programmer

£8,538-£9,471 p.a. Incl.

We ere seeking a Senior Programmer to head o teem of four programmers who will be an experienced ICL COBOL programmer with at least one of the following lengueges: PLAN, T,P.L., or C,D.E. and be skilled in structured programming. The Authority has invested becally in Computer Passures and its throught in the street of the street programmer. heavily in Computer Reseurces and is responsible also lor providing a service to the neighbouring Soroughs of Surrey Heath and Runnymede.

The Council's computer configuration comprises an ICL 2904 installation with 94K, EDS60's, train printer, 1501 CDE data entry end on Ine enquiry from 4 video Terminala. The instelletion has recently been enhanced with on-line fedilities I MINIMAC; and an extensive Cash Receipting network.

TEMPORARY HOUSING will be available in approved deser along with generous removal and disturbance allowances together with legal fees on house

Please contact the Chief Personnel Officer, Counct Officer, Woking Surrey (Tel: STD 04861 5931 Extr. 17) for epplication form and job description. Closing date: 17th February, 1981.



BOX NUMBERS

Box number replies should be addressed to:

ole Computer Weekly Derset House Stamford Street London SE1: QLU

emotive issue some thoughts on why people buyer react positively at that buy and the difference bestuge, it may well be that his tween the preduct they buy prime mutivation is the desire

are consciously or sub-conscinusly wishing to satisfy.

This week, I would like to present a different aspect of he same situation; that is, escalating telephene costs, or People do not necessarily even to catch whoever it is huy the sante product fer the keeps 'phening his ountie it same reasens".

Inasmuch as the permuta-Brisbane every uther lunch-

break, One thing is certain. It tion of individuals and their particular situations is infi-won't be because the machine tile, the chances of two looks seay or due to ite readpeople in similar circum- only-memory having an stances liaving the some muti- access time two nanosecon varienal furces are very re- faster than the competition. Identifying these individual

People cannot be arbitrarily motivations demands a categorised in terms of what is likely to turn them on or off attributes, particularly on and to assume is generally te effective questinging technibe mistaken.

It is essential, therefore, and the ability to listen, as that salespeople develop the opposed to hear. Frequently skill to identify these emotional factors quickly, for without this level of undergraphic truth can be perceived in little more than innuendo. standing it is impossible to present the reasons for pur-

Motivations

You may think ell this sounds obvious. We all know forward economy as the main reason for buying a particular car if the potential elient is looking for a symbol of his covered, collepsible metal senior status.

On the other hand, the simple iruih, no more transportation manager for the same company might see selling practice. ecocomy as the only signifi-cant consideration. One

sense, ia often overlooked in selling practice. Here are some of the motivational forces that reside man's meat is another man's within the selling arena: susrenance, anxiety, security, prestige, comfort, affection, sex, health, curiosity, politics, tasie, inertia, pride, averice, For instance, the salesman may describe the telephone megalomania, malice, credi-

bility, acceptance, impulse popularity, self-expression. There are others, of course. All the salesman has to do is identify those which are most

coming and outgoing calls for every extension in the building.

CONFERENCES

Megalomania?

monitoring system he is selling as capable of giving complete management control of individual telephone usage

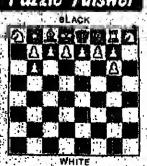
Electronic mail takes off

RLECTRONIC mail is about to take off in Europe. Results of sudden made by the PTTs (Germany's KTK, Sweden's Office 85, France's Nora-Minc CCITT, and CEPT Study Group) are now THE international Computing Symposium this year reports on the state of the art, of systems architecture. The alm is to foster the exchange of ideas between accentages, computing professional computing and managers. meny's KTK, Swedea's Office

85, France's Nors-Mine CCITT,
and CEPT Study Group) are now
emerging through a series of announcements which indicated the
imminent student of electronic
mail on a large scale. The third
attribut Symposium on Electronic
Mail and Messaging goes into the
subject in detall and provides a
technology update. Organised by
the Yankeo Group, is will be held
from March 23-24 at the Cumber.

architecture. The sim is to foster
the exchange of ideas between
acientists, computer normal trends in systems and managers
on problems, new techniques and
authors to address the confirence
will be Computer Weekly columinst Tom Gillo. The conferdate is sponsored by Computer
Communications and Micropysioms jeture.

Puzzle Answer



from March 22-24 at the Cumber:

land Hotel, Londen. Further informatino from Al Dunn, Yarkee

Group, Regal House, Lower eation. University of London.

Rickmansworth, Heris, Tel:

109278) 4714. Conferences, Surrey House, Throwley Way, Sutton, Surrey, Tel: 01-643 8040. SELLERS of computer systems

SELLERS of computer systems, word processing systems, perly personal and surplies are expected to come together at Comdex 81, to be held in the Convention Centre in Nevada, Las Vegas. Exhibitors last year included Apple Computer inc. Control Data, Honeywell, Information Systems and Zilog. The exhibition, to be held from November 19-22, will feature scheduled Press conferences and the option of direct mail follow up after the show. For further information contact the organizer. The Interface Group, 160 Spren Street, Framingham, Massachusetta 01701, USA.

SAUDI ARABIA **PROGRAMMERS PROGRAMMER ANALYSTS BUSINESS ANALYSTS**

IBM Experience PL1, IMS or MARK IV

Are you interested in working in Saudi Arabia?

Salaries up to £25,000 per annum plus accommodation, living and travel expenses.

> **Phone Paul Swaysland** on 01-680 2400

Metra Lowndes-Ajax Limited 17 Lansdowne Road Croydon, CRO 2BX

SALES EXECUTIVE

London Area

c. £16,000+

Mouncey end Pertners, one of the longest-established Coneultency Softwere Houses, ere expending their current seles teem.

We era looking for a professional eeleeperson with the following qualifications to sell our various consultency and development

- A proven seles record for several years
- Currently selling in the eoftware/bureau industry
- Ideally selling in the London/Homa Counties area:
- 'Aged between 25-35 years with a poeitive and self-
- Enjoys selling end developing client relationships

Eemings will include a high selary end commission amounting to at least £16,000 p.s. on terget edles, plus the following:

- Company car end expensee:
- Normal benefits including pension, B.U.P.A., etc.

Interested? Then contact Alan Fenn on 01-486 7777 or write to him



Mouncey & Partners Umited 13/14 Cornwell Terrace Regent's Park London, N.W.1

SOFTWARE ENGINEERS

At GTE ATEA we have a long history of signficant contribution to the development of teleponyin Europe and are rapidly expanding our commitment to the public and private markets for processor based communications systems.

This expansion creates vacancies in our development teams for managers, supervisors and experienced software engineers, both here in Belgium and on temporary assignment in the

We seek engineers with two to ten years' software experience in real-time systems (depending on job function), or equivalent telephony experience with an inclination towards

Applicants should be educated to degree or HND standard.

Successful candidates may be offered the opportunity to work during a training period of several months in one of the laboratories of our. parent company GTE in the United States before joining our permanent staff in Belgium.

Interested persons should apply in writing, with curriculum vitae, to Mr. L. Luyten, GTE ATEA N.V., Industriepark Klein Gent, 2410 Herentals, Belgium, who will treat all applications as strictly confidential.

GTE ATEA

TRAINEE SYSTEMS PROGRAMMER YankeeGroup Circa £5,000

Geteway Building Society — one of the larger Societies in the county

require a Trainee Systems Programmar for work at their Office in Worthing on the Susanx goast.

To assist in the inetaliation and meintenence of system software

The applicant should have at least 18 months experience of using

European sales

PROGRAMMER

REQUIRED
Minimum one year besid Pasgal-Portran experience
Knowledge of spoounting
mysteria useful.
Balay 64,000-00,000 meg.
Tel-McGC-UTO.
Egylandorfan 374334

IBM herdwere and software or should have sultable academic qualifications in computing. The Installation: The Society operates an extensive teleprocessing network based on an IBM 370/148 at Worthing. Software in use includes VM, DOS, GC

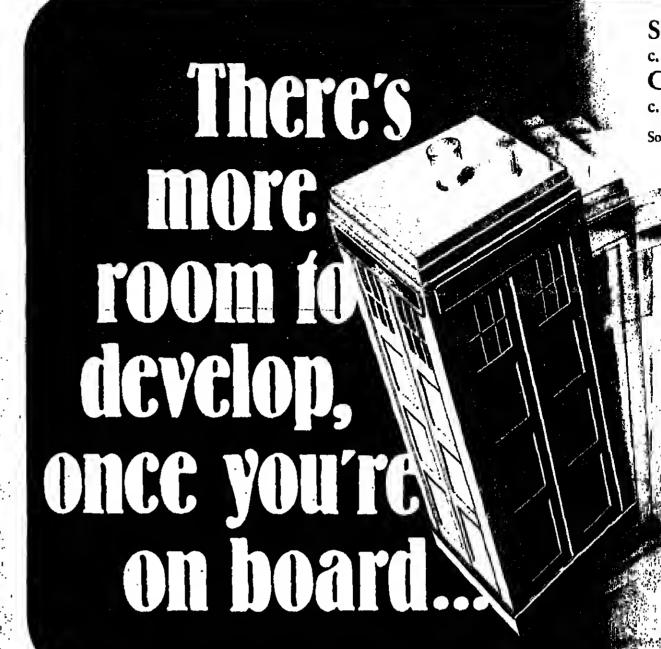
Benefits:

* Preferential Mortgage Rate

* Free Life Insurance obver

* Subsidised Junches Good recreational facilities including swimming pool, st

Applications giving datails of relevant experience and qualification should be sent to:
Personnel Officer, Gateway Building Society
P.O. Box 18, Worthing
West Sussex BN13 20D



Senior Consultants

c. £11,250+ London weighting + car

Consultants

c. £10,000+ London weighting + car allowance

Sometimes it feels as though time is standing still. What once was a challenge is now routine; you know your software and

hardware inside out, or the ground you cover in one application today is the same you covered yesterday — and will probably

Data Logic's Professional Services Division can add a new dimension to your career. As one of the UK's leading software houses, we are not confined to one range of equipment or set of applications.

Our projects span all aspects of commerce and industry, and we naturally have the pick of the best hardware, software, systems and techniques on the market.

if you have senior-level DP experience (preferably involving exposure to the HP 3000 range), consultancy will give you the breadth and depth you need to develop in. We're looking for the talented professionals who can provide the key link between a client's problem and its technical solution by applying a high level of specialist technical

For Consultants, basic salaries are negotiable at around £10,000 plus car allowance. Senior Consultants can talk in terms of £11,250 plus company car. In either case, benefits include London weighting, profit share, free BUPA, life assurance, health insurance and pension scheme.



If you're ready to step into a new career dimension, telephone or write for an application form (or send full e.v.) to: David Robinson, Data Logic Limited, 320 Ruislip Road East, Greenford, Middlesex, Tel: 01-578 9111.

Add a new dimension

CALIFORNIA

For the start of '81 we at Independent Software Support can offer many medium- and long-

IBM

COBOL, IMS, CICS 39 PROGRAMMERS With s minimum of 5 years' D.P. experience with 2-3 years' IMS.

ARIZONA HONEYWELL

IS SYSTEMS PROGRAMMERS GCOS - GMAP Conversion

With minimum 4 years' GCOS experience. ★ All the positions estry high salaries and a full relocation package.

cor more information please get in fouch with Joan et 185 oc: 91-637 4704 or write to Independent Software Support (USA Division), 217-118 Tottenham Court Road, London, WIP 9AF.



ASSISTANT TO DP/WP **CO-ORDINATOR**

An expanding Lloyds Insurance Broker is sesking a person of 24/25 years of age to act as an essistent to their DP/WP Co-ordinator.

The applicant must have some IBM system 3/34 operational and programming sxparlence, Also preferably some insurance

Salary negotiable circa £7,000. Suitable applicant please contact: Mrs. S. Palmer on 01-481 3904

LECTURER IN COMPUTING SCIENCE

CUMPUING SCIENCE
Applications are invited for a Lectureship in Computing Science
tensible from October 1, 1981.
The Lectureship is an any branch
of Computing Science.
Applicants should prefere by
pessess a good honouse degree in
Computing Science with a
research degree as well. Applications will also be considered from
persons whose limit degree was in
another aubject but who exresearch degree had a substantial
computing sterrient and who wigh
to einter the Computing Science
field.

Selery will be within the renge 5505-59095 of the Lecturers' scale of £5505-£11575, with placement seconding te age, qualifications and experience.

Further particulars may be obtained from the Secretary of the University Court (Agent, 13), University of Electors, 613-200.

UNIVERSITY OF GLASGOW Department of Computing **IMMEDIATE** SALES **OPPORTUNITIES**

manufacturers of:

 Deta collection and communications systems, O.Q.E. £18+, Mid and North.

 Minicomputers, major A/L Sales. 0.Q.E. £17+. North,

Minicomputer systems. Area sales.
 £20k+. North and Midlands.

Contact immediately, quoting JV8/JB



Insight Marketing

and Personnel Consultants Ltd

GUIDE TO RECRUITMENT CONSULTANTS IN THE U.K.

LONDON & H. COUNTIES (LH). MIDLANDS (M). NORTH (N). SCOTLAND (S). OVERSEAS (O)

NORTHERN IRELAND

ALL COMPUTER STAFF NEEDS

Computer Professional Recruitment

COMPUTER PROFESSIONALS - MAKE SURE WE HAVE YOU'IN MIND

Consultency

Ivor Norton Management Services Ltd Recruitment Consulting Division

52 Shaitasbury Avenue. London WTO 706 01:734 8562 724 hour anhwening service I P.O. Box 63. Cophiali Towar House, Histogate HG1 115. Tel: Hamogate 50028

MAPORARY AND PERMANE

ALL COMPUTER STAFF NEEDS ESCO MANAGEMENT CONSULTANTS LIMITEI 77 Batanic Avenue , Battais ET7 1JL Tel: Selfast 48088 sestorial relieble, chilida

FOR THE BEST PERMANENT AND CONTRACT JOBS IN THE NORTH OF ENGLAND

COMPUTER INDUSTRY SPECIALISTS

INSIGHT MARKETING & PERSONNEL CONSULTANTS LTO. AUSTIN HOUSE, CHARLOTTE STREET, MANCHESTER, TEL: 061-238 7026

FOR FURTHER DETAILS OF THIS WEEKLY FEATURE CONTACT

OWEN KELLY, 061-872 8861